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Ontario

ROYAL COMMISSION OF INQUIRY INTO CERTAIN
DEATHS AT THE HOSPITAL FOR SICK CHILDREN AND
RELATED MATTERS.

Hearing held
8th floor
180 Dundas Street West
Toronto, Ontario

The Honourable Mr. Justice S.G.M. Grange

P.S.A. Lamek, Q.C.

E.A. Cronk

Thomas Millar

Commissioner

Counsel

Associate Counsel

Administrator

Transcript of evidence
for

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53

CIMBURA

X: (Cont'd)

Roland

Kitchy

Olson

Jackson

Labas

Tobias

Shandran

Shenker

Rehan PMK



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Hearing held on the 8th Floor,
180 Dundas Street West, Toronto,
Ontario, on Thursday, the 20th
day of October, 1983.

- - - -

THE HONOURABLE MR. JUSTICE S.G.M. GRANGE - Commissioner
THOMAS MILLAR - Administrator
- MURRAY R. ELLIOT - Registrar

APPEARANCES:


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D. HUNT)	Counsel for the Attorney
L. CECCHETTO)	General and Solicitor General
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	and Coroner's Office)
I.J. ROLAND)	Counsel for The Hospital
M. THOMSON)	for Sick Children
R. BATTY)	
D. YOUNG	Counsel for The Metropolitan
	Toronto Police
K. CHOWN	Counsel for numerous Doctors
	at The Hospital for Sick
	Children
F. KITELY	Counsel for the Registered
	Nurses' Association of Ontario
	and 35 Registered Nurses at
	The Hospital for Sick Children

(Cont'd)



APPEARANCES (Continued):

D. BROWN	Counsel for Susan Nelles - Nurse
E. FORSTER	Counsel for Phyllis Trayner - Nurse
J.A. OLAH	Counsel for Janet Brownless - R.N.A.
B. JACKMAN	Counsel for Mrs. Christie - R.N.A.
S. LABOW	Counsel for Mr. & Mrs. Gosselin, Mr. & Mrs. Gionas, Mr. & Mrs. Inwood, Mr. & Mrs. Turner, and Mr. & Mrs. Lutes (parents of deceased children)
F.J. SHANAHAN	Counsel for Mr. & Mrs. Dominic Lombardo (parents of deceased child Stephanie Lombardo); and Heather Dawson (mother of deceased child Amber Dawson)
W.W. TOBIAS	Counsel for Mr. & Mrs. Hines (parents of deceased child Jordan Hines)
J. SHINEHOFT	Counsel for Lorie Pacsai and Kevin Garnett (parents of deceased child Kevin Pacsai).



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EMT.jc

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--- Upon commencing at 10:00 a.m.

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THE COMMISSIONER: I guess, Mr. Roland,
4 you are next.

5

MR. ROLAND: Yes.

6

GEORGE CIMBURA, Resumed

7

CROSS-EXAMINATION BY MR. ROLAND:

8

Q Now, Mr. Cimbura, before we get
started on questions about your methodology and your
9 reports, I understand you have today with you, or at
10 least are able to tell us today what reports and
11 literature you were referring to in giving therapeutic
12 and fatal toxic ranges for digoxin concentrations in
13 heart muscle and lung and liver tissue. Is that so?

14

A. I understood it to be lung
tissue and liver tissue.

15

Q. Yes.

16

A. Yes. I have looked at my notes
17 last night.

18

Q. Yes.

19

A. And I have some literature
citations that were noted by me some time, and I have
20 those available.

21

Q. All right. I take it you are
22 not sure whether you had those citations at the time
23 you did these ranges - set these ranges out - or at
24 some later stage?

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A. Well, with some of them it is hard to say.

Q. Yes.

A. With some I believe I did use them at the time.

Q. All right. Now are there a lot of citations?

A. I can list them if you wish me to.

Q. Would you mind?

A. With respect to lung tissue it was a report prepared by Aderjan, A-d-e-r-j-a-n, and other authors, and was published in Archives of Toxicology 42, pages 107 to 114, 1979. This I believe referred to the levels on therapy.

Q. Yes. What ranges did that article provide for therapy?

A. Well, I haven't read the ranges.

Q. All right.

A. Recently.

Q. All right. Sorry.

A. I have a notation and I don't know if it is based from some notes I prepared previously in this paper - a value of 16.2 plus or minus 8.1, but I haven't - last night I haven't read all these papers again.



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Q I appreciate that. All right. Well, we can look them up ourselves and perhaps you could give us the other citations.

A Yes. Regarding concentrations found in poisoning cases with respect to lung tissue a paper authored by Sedgwick, S-e-d-g-w-i-c-k, and other authors, Clinical Toxicology, 18(8), 887 to 893. Year 1981. Second, also a paper I just previously mentioned, the Aderjan Paper.

Q Yes.

A As well has some data on poisoning cases.

Another paper by Selesky, spelled S-e-l-e-s-k-y, and other authors, published in Journal of Forensic Sciences, 22(2), page 409 to 417; the year 1977.

Also a paper by Steentoft, spelled S-t-e-e-n-t-o-f-t, published in ACTA Pharmacological and Toxicological, Volume 32, pages 353 to 357, 1973. This is with respect to lung tissue, and as I said, I am not really certain whether that was the exhaustive list at the time that I had.

Liver tissue with respect to concentrations on therapy, Anderson and other authors, ACTA PED. - I assume that is Paediatric - Scandinavian,



A.4

1
2 Volume 64, page 497, 1975. Another paper by
3 Karjaleinen, spelled K-a-r-j-a-l-e-i-n-e-n, and other
4 authors, ACTA Pharmacological and Toxicological,
5 Volume 34, page 385; year, 1974.

6 Aderjan also, which I have cited
7 previously, I believe has some information to that
8 effect, and Sedgwick which I have mentioned previously
9 also some information I believe in that respect.

10 And with respect to concentrations
11 found in poisoning, Selesky and others which I have
12 mentioned already, Sedgwick and others, which I have
13 mentioned already, Dixon and Blazey, Forensic
14 Science, Volume 9, 145, 1977; Aderjan et al which I
15 have already cited, and Steentoft which I have already
16 cited.

17 Q Thank you. Now turning to
18 Exhibit 213 at page 5 of that exhibit you have given
19 us your interassay precision studies, and can you tell
20 us in the course of doing your various RIA runs did
21 you run more than one control per run? What was your
22 standard practice in terms of controls?

23 A Could you help me find the
24 document, please?

25 Q Sorry, yes. It is the one that
was put in evidence yesterday, and I think it is
Exhibit 213.



A.5

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MR. LAMEK: It is your collection of
papers.

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MR. ROLAND: And on page 5. You have
given us your mean and your standard deviations.

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6

MR. HUNT: Just give us one second
here, Mr. Roland.

7

8

THE COMMISSIONER: Page 5?

9

MR. ROLAND: Page 5, yes.

10

THE WITNESS: And what was your
question regarding?

11

12

MR. ROLAND: Q. Those are your results.
In the course of doing your various RIA runs on samples
did you have more than one control or did you have
more than one control or how many did you have?

13

14

A. You mean any samples that we
analyzed or just --

15

16

Q. Yes. When you did an RIA run,
the samples that you analyzed?

17

18

A. And for any samples or just for
this experiment?

19

20

Q. No, for any sample.

21

A. For any sample?

22

Q. Yes.

23

A. We used a minimum of one control.
Q. Yes. How many did you generally
use?

24

25



A.6

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A. We may have used a second one.

3

Q. Yes.

4

A. Sometimes, but I am not sure. I

5

would have to check more details. But a minimum of one.

6

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Q. And when you did this precision study can you tell us with respect of each particular run how many tubes did you have? You have said that there are 86 different assays performed?

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9

10

A. Yes.

11

Q. How many tubes did you have

12

with respect to each run?

13

A. With respect to each assay?

14

Q. Yes.

15

A. I couldn't - I would have to go

16

back to the assays.

17

Q. In this study?

18

A. Yes.

19

Q. I take it you had more than one?

20

A. Tubes for what?

21

Q. For running these 86 different

22

assays performed in the period.

23

A. Well, each assay would have a

24

varying amount of tubes.

25

Q. Yes. Okay.



A.7

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A. You know, sometimes our assays
may have had up to 74 tubes altogether.

4

Q. Right.

5

A. Sometimes they had less tubes,
depending on how many samples we put with each assay.

6

7

Q. All right. So that I understand,
this 86 different assays is the very assays that you
performed in the course of carrying out the work of
your report which is put in as Exhibit 95. Is that
correct? Is that how I understand it?

10

11

A. Yes. These are 89 assays --

12

Q. 86 I think it is.

13

A. Sorry, 86 assays.

14

Q. Yes.

15

A. Which were used for the - at
least most of which I think were used for the analyses
of case samples as well.

16

17

Q. I see. All right. So then what
you are telling us is each time you did these 86 assays
you had at least one control tube?

19

20

A. That is right.

21

Q. And sometimes more than one?

22

A. Sometimes we may have. I would
have to check it. We did over 250 assays.

23

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Q. Yes.

25

A. And I would have to check them
exactly.

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/DM/ak

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Q. I take it it is standard practice, it is standard practice at least for hospitals when they are doing these RIA studies that they run two or generally three control tubes in order to assure that there is no marked variation in the results attained compared to the standard serum; are you aware of that?

A. They may run two or three.

Q. We have had in evidence at least that the Hospital for Sick Children runs two or generally three controls when it does an RIA run. I take it you would want to do that if you were concerned about precision in order, to assure that you didn't have any substantial variation from the standard serum that you were using, or the standard in your case saline that you were using.

A. Are you saying they would want to do it?

Q. I take it as a scientist you would want to do it.

A. Pardon me?

Q. As a scientist I take it you would want to do that, you would want to use if possible more than one control per run in order to assure that you are not getting a substantial



1
2 variation from the standard.

3 A. Well the value of the control
4 that I attach to the RIA is sort of a check on any
5 major problem with RIA.

6 Q. Yes.

7 A. And I think one control really
8 gives me that information.

9 Q. Now you have told us about
10 analyzing the samples with RIA, and then HPLC, and
11 then you would perhaps do that several times and
12 then reanalyze the sample by RIA. As I understand
13 your evidence you used the HPLC from time to time
14 in order to separate out the digoxin from the digoxin-
15 like substances, is that right, is that how I under-
16 stand it?

17 A. I am not sure if I understood
18 you correctly; but for our normal procedure we don't
19 run the HPLC several times, is that what you are
20 saying?

21 Q.) Well, I thought you said to
22 get some better or purer samples you had done the
23 HPLC several times.

24 A. This was with respect to doing
25 mass chromatography, mass spectrometry studies where
you need a greater purity.



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Q. In any event you did the RIA then you did the HPLC on some samples and then you redid, analyzed the sample with an RIA.

A. Quite often we did RIA, then we did another RIA before HPLC, and another RIA after HPLC.

Q. And in doing the HPLC as I understand it you were able to separate out the dig. from the dig. like substances?

A. We were able to separate out the substances that we tested.

Q. Yes.

A. And I have indicated that on another document somewhere, those substances.

Q. And you put in as, I think it is, Exhibit 215 a table showing the retention time in minutes for various substances that are run through the HPLC, and digoxin shows a retention time of 9 minutes, do you see that?

A. Yes, that is the document that I had it as "HPLC behaviour of digoxin, metabolites" is it?

Q. Yes.

A. That's right, digoxin has a retention time under these conditions of 9, that is right.



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Q. And I take it what you did is you extracted off in the HPLC procedure the substances that had a retention time of 9 minutes or thereabouts.

A. We collected a fraction, that's right.

Q. Yes.

A. At that time.

Q. And what was the range you used around 9 minutes to collect the fraction, I take it wasn't precisely that one second that represents 9 minutes, but you had a time range around 9 minutes?

A. That is correct, sir. For the analysis of case materials - well usually very often it varied between 2 millilitres which would be 2 minutes, or 1.33 millilitres, or 1.33 minutes.

Q. That is the range 2 to 3 minutes around 9 minutes?

A. Where the 9 would be in the middle, that's right.

Q. 9 would be in the middle?

A. Yes.

Q. So you might have as short a



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time as $7\frac{1}{2}$ and as great as $10\frac{1}{2}$, that will be the
outside I take it?

A. Well, as I mentioned in some
instances we used the 1.33 minutes.

Q. Yes.

A. So if you, half of that would
be what?

Q. I see, I thought I heard you
say 2 minutes to 3 minutes.

A. No, 1.33 or 2.

Q. Oh, I am sorry, so the range,
the outside range would be 8 to 10?

A. That's right. Sometimes we
also use 1 millilitre but not very often.

Q. Were you able to identify in
the HPLC procedures what the digoxin-like substances
were?

A. I don't know what you mean,
sir?

Q. Well, I take it that the
digoxin-like substances, some digoxin-like substances
were shown on the HPLC as well. Were you able to
identify them using the HPLC process?

A. Do you mean the digoxin-like
substances that I referred to in my report?



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Q. Yes.

A. In the Klotz medium, is that what you are referring to?

Q. Yes.

A. No, we spent some time trying to identify them. We did some research, not really very much because of our time schedule, but as I recall it we did subject the Klotz solution to - well we subjected Klotz solution to HPLC separation and we did not see an indication of other than digoxin. We didn't see any indication of any other substance under the conditions that we used it.

Q. I see.

A. Which would imply to me that whatever the substances are do not elute in this time frame that we use for digoxin. We also did another study, tried to identify it by using the mass spec. in one instance as I mentioned yesterday, and again this was positive for digoxin and negative for digoxigenin, which was one of the substances we thought might be present in the Klotz medium.

Q. We will get to the mass spec, in a moment. I gather at this stage you have heard of Dr. Seccombe's work and you are familiar with other work done by others including Gruber et al



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2 in a review published in 1980 concerning the water
3 loading studies of animals, and I think there are
4 other studies like that that I presume you are
5 familiar with that there is in the scientific
6 community now some serious suggestions that there
7 is a substance, and I think it has been referred to
8 most often as substance X, that on HPLC may come
9 off or have a retention time that is within the
10 range that you have indicated for digoxin. Are
11 you familiar with that?

12 A. Well, to answer, I have seen
13 no studies where substance X was proven to have
14 a similar retention time on HPLC for digoxin.

15 Q. But if a substance yet
16 unidentified does have a similar retention time to
17 digoxin, the kind of retention time and in the
18 range that you have indicated, I take it then all
19 of your findings presented in your report may have
20 at least the possibility, let us set aside the
21 mass spec. cases for a moment, but apart from them
22 the possibility that there is substance X in
23 addition to digoxin, or substance X instead of
24 digoxin that you were analyzing by RIA and HPLC,
25 that possibility exists I take it?

A. Well, the way you worded the



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question I think it would be a speculative
possibility.

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Q. Yes.

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A. First of all the levels of

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substance X that were found were relatively very

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small, so that your second part of the question it

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could be either/or it would not be relevant and it

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would be speculative.

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Q. What you say is that from what you know now is with the quantities that you have been able to detect you doubt very much that substance X could represent those kinds of quantities?

A. On the basis of what I have seen.

Q. Yes.

A. The largest values I have seen were I believe around four. I cannot recall now whether one was six or not. That is the largest values I have seen in the literature.

Q. Well, let us set aside the volumes for the moment or the quantities and simply talk about the existence or non-existence of substance X as being a possibility in your procedures. I take it though that if you agree that if substance X has the same retention time range that digoxin has in your HPLC studies, that there could very well be present there a substance other than digoxin but like digoxin?

A. Well, if substance X has an identical retention time of digoxin then of course it would elute at the same time.

Q. Yes. And if it has a



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retention time that is within the range you have told us of 8 to 10 or something less than that when you use 1.33 with 9 as the mean, if it was within those ranges it would elute as well?

A. That's right, if it has that range. There is one more consideration, however. There have been no studies that I have seen that substance X was measured after extraction. All the studies that I'm aware of I recall have been done without extraction, at least as far as I am aware.

Q. Right.

A. And there is another consideration, I should say, that in at least one child we have not only tried one HPLC column but we have tried in effect three different HPCL columns.

Q. Yes.

A. This was the child Belanger that I believe I referred to yesterday.

Q. Yes.

A. And two of these columns were different in the reverse phase of the HPLC analysis and one column was different in the normal phase of the HPLC analysis. In addition to that, we tried another antibody, again obtaining positive results.

Q. Yes.



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A. In view of that, I would have to conclude that it is very unlikely that substance X was present there.

Q. Well, let me just ask you this.

A. Unless it is digoxin.

Q. Yes. Well, let me just ask you about what you have told us about, your HPLC procedure on Belanger. You told us that you did some reverse columns as well?

A. Well, reverse was our usual procedure.

Q. I see.

A. On Belanger we tried the regular procedure in reverse as well as a different column in the reverse phase.

Q. Yes.

A. A column called micro bondapak column. In addition to that, we tried the HPLC separation in a normal phase using still a different column called porasil, as I recall it.

Q. Well, is the effect of that, those procedures on the Belanger samples that you narrow the range of retention time even further than the range that you have told us would be normal for

12:10



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an HPLC procedure?

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A. I am sorry, sir, I don't understand what you are saying.

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Q. Well, I am not sure I understand the purport of what you are telling us by doing reverse columns and so on. I presume it gives you a more precise extraction than a normal HPLC run?

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A. Not really from that point of view. To do a different column means that the elution, retention time will change for digoxin. So, from that point of view if it still comes from a different time it increases your certainty that it is digoxin. If you use a third column, again, the elution time, the time will change.

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Q. Yes.

A. And again if the digoxin comes at that different time well it still farther increases my confidence that it is digoxin.

19

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Q. Yes. What you are saying is by doing it three different times in different ways each digoxin like substance is going to have to be very much like digoxin to be indistinguishable with those three procedures used?

23

24

25

A. That's right, and based on my



1
2 experience and knowledge with these analyses I am
3 satisfied to a reasonable degree what I consider of
4 scientific evidence that it is digoxin.

5 Q. And dealing with mass
6 spectrometry, you have told us that that was done
7 with respect to a couple of samples. I gather from
8 what I understand from mass spectrometry that it is
9 a process whereby molecules are smashed, basically,
10 and that what you have is particles that are split
11 off from the molecules and that they show two things.
12 They show a distinctive characteristic and they
13 show a distinctive activity that helps you identify
14 what the molecule was. Am I on line, is that
15 basically what mass spectrometry does?

16 A. Well, basically, yes. I
17 am not a mass spectroscopist myself but basically
18 this is what happens that a molecule is bombarded
19 by a stream of elctrons.

20 Q. Yes.

21 A. And broken into fragments
22 and the fragments or the molecule, depending what
23 form, there are many forms - well, not many - but
24 different forms of analyses you can do on mass
25 spectrometry.

Q. Yes.



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A. But in general these fragments then are analysed by instrument and can be characteristic of the drug.

Q. Yes. Of the molecule itself. You are trying to determine what that molecule is, I take it, that the particles come from and that molecule hopefully tells you what the substance is?

A. Well, again, depending on what version of mass spectrometry you do.

Q. Yes.

A. From some you get more precise information with respect to molecular weight, from some you get less information. But in a sense you are always comparing a standard again with the unknown and it is under similar conditions and in a sense you are comparing the fragments that you obtain with a standard, with the fragments that you obtain from the unknown. That is in a sense what happens.

Q. And I gather what you have is a mass spectrum tracing or print-out on a piece of paper that someone who is qualified, a mass spectroscopist is capable of analyzing?

A. Well, the mass spectrometry is usually coupled with the data system which produces



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charts at the end, that's right.

Q. Yes. And do you have those charts, those mass spectrum tracings from the studies that you did with respect to Lombardo and the other one was Belanger I think?

A. Yes, I have some, yes.

Q. Yes.

A. I'm not sure whether they are complete but I have some, yes.

Q. I see. Do you have the ones that come from - you don't have all of them that came from those studies?

A. Well, I may have all of them. I'm not sure, I would have to get the mass spectroscopist who had done it to go over them.

Q. Yes. Who was the person that did the study?

A. This was Dr. Zamecnik, Z-a-m-e-c-n-i-k.

Q. I see.

A. He did the final instrumentation. Of course, there was a lot of work before the instrumentation, as I believe I mentioned yesterday, extensive purification of the sample is necessary before the sample is even introduced into the equipment.



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Q. And is he the person that
interpreted the tracings?

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A. Yes.

5

Q. Yes, right. Is he with the
Centre of Forensic Sciences?

6

7

A. No, he is now with another
agency. He is here in Toronto.

8

9

Q. And I take it you have no
experience yourself, at least not enough to interpret
those tracings?

10

11

A. Well, I am familiar with them.
I am not a mass spectroscopist.

12

13

Q. Yes, but I take it it takes
some expertise to be able to interpret the results?

14

15

A. Well, to understand the
principles.

16

17

Q. Yes.

18

A. And to interpret it correctly
under some circumstances, yes, it can take a great
deal of expertise, yes.

19

20

Q. And do you have as well the
criteria used to interpret those print-outs or

21

22

tracings. I take it there are some criteria that
have to go along with the tracings in order to

23

understand them. Do you have that criteria as well?

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A. I'm not sure what you mean
by criteria.

Q. Well, I gather that you have
to be able to identify some known substances on the
mass spectrum tracings?

A. Well, your own standard,
that's what I mentioned.

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Q. Yes. And I gather you have some documentation that sets out those standards as the criteria you use to interpret the tracings?

A. I believe so. It is a normal procedure to run standards, yes.

Q. Yes. Perhaps you could provide the tracings in that criteria setting out the standards to Mr. Lamek at some time at your convenience so that we could have a look at them or at least so that our experts could have a look at them because they seem to be very important in this case, and these matters, especially with respect to Baby Lombardo because as I understand your evidence you have indicated that you or the mass spectroscopist has positively identified digoxin in the studies that were done on the samples from Baby Lombardo.

A. The result was positive.

Q. Yes.

A. In his opinion.

Q. Could you provide those documents and that material to Mr. Lamek? Is that possible?

THE COMMISSIONER: I think the first question is are you able to do it? Are there such?



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THE WITNESS: I believe we have them,
sir.

4

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THE COMMISSIONER: All right. Is
there any objection to their being provided?

6

MR. HUNT: No.

7

8

THE COMMISSIONER: Then if you wouldn't
mind - all you want is you want to have your experts
look at it?

9

10

MR. ROLAND: I would like to have
them look at it, yes.

11

12

THE COMMISSIONER: So it is -
he doesn't have to rush right out now?

13

14

MR. ROLAND: No, there is no rush.
It can be done at his convenience.

15

16

Q. Do you have the same documenta-
tion with respect to the work done on samples from
Baby Belanger?

17

18

A. Are you referring to GC mass
spec. again?

19

20

Q. Yes.

A. Yes, I believe so.

21

22

Q. I would like you to provide
those if you could as well.

23

24

25

Turning to Exhibit 95 which is your
report, or an accumulation of your reports, at page 4

D2



D3

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Note 3 you give a range for digoxin at a therapeutic level in heart muscle --

THE COMMISSIONER: Page 4. Is this 95A?

MR. ROLAND: This is 95A, yes, and Note No. 3 at the top of page 4.

Q. And as well you give a range for fatal poisoning by digoxin, and it is obvious there is a very substantial overlap between those two ranges. In fact the overlap you show there is from 108 to 975.

I gather as well --

A. I am sorry, which page is it? I am not sure exactly.

THE COMMISSIONER: This is Note 4, is it?

MR. ROLAND: Note 3 on page 4.

THE WITNESS: Okay. That is right.

MR. HUNT: Have you got it?

MR. ROLAND: Q. I gather in those ranges as well there was a range of toxic levels that are non-fatal; that somewhere in that range that you have given, that very broad range that you have given it can be said that there are toxic levels but non-fatal. Is that fair?



D4

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A. In which range?

Q. Well, in the very broad range that you have given that shows an overlap, certainly between 108 as the lowest fatal poisoning range and 975 is the highest therapeutic range.

A. Yes.

Q. I gather there is first in that range a toxic but non-fatal range as well?

A. Well, there may be but I have no awareness of it.

Q. No.

A. My range, fatal range, is compiled on the basis of death by digoxin overdose.

Q. Yes.

A. My therapeutic range has been compiled on the basis of children on digoxin therapy so that I really don't - you know I cannot say whether there is, that there shouldn't be in these two ranges as I compile them.

THE COMMISSIONER: Were they all taken from children who died whether they died from the digoxin poisoning or some other --

THE WITNESS: That is correct.

THE COMMISSIONER: I suppose you are depending upon the advice of the pathologist or



D5

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2

someone else as to what they died from because you
have no way of knowing yourself?

4

THE WITNESS: Oh, yes, that is right.

5

The children that I have studied, the information
I had available to me is the fact that they did not
die of digoxin poisoning, the ones that I have used
as a control.

8

9

THE COMMISSIONER: You are not
including these critical infants in your statistics
because that is what this Commission is all about,
to find out whether they died from digoxin poisoning
or from some other causes.

10

11

12

13

So I take it you are not including any
of these babies that you are investigating in your
calculations?

14

15

16

THE WITNESS: No, sir. No, these
are separate children, that is right. Separate
people.

17

18

THE COMMISSIONER: Yes. Where did
you get that information?

19

20

THE WITNESS: Well I --

21

THE COMMISSIONER: Is that part of
the tests that you have shown us here?

22

23

THE WITNESS: Yes. As far as the
therapeutic range in heart of infants I have showed

24

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D6

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the document yesterday.

THE COMMISSIONER: Yes.

THE WITNESS: And as far as the
fatal range of course is based on literature.

THE COMMISSIONER: Yes.

THE WITNESS: But the children under
investigation are not included.

MR. ROLAND: Q. And, Doctor,
yesterday you showed us a therapeutic range in heart
tissue I think in the neighbourhood of 300 and
something, but you give as your therapeutic range
an upper limit 975, and I gather that comes from
the literature?

A. That as a matter fact is the
only value that I found to be so high.

Q. Yes.

A. In the literature, but it is
a literature value, yes. It is a value and I even
recall it because it somehow doesn't fit in to all
the other values. It is a work published by
Gorodischer in Buffalo.

Q. His work is "Tissue and Erythro-
cyte Distribution of Digoxin in Infants".

A. I believe that is the one.

Q. Yes. And it was published in



D7
1
2
3 1975. And he shows another value in that study of
4 some --

5 MR. HUNT: May we have a copy for
6 the witness, Mr. Cimbura?

7 MR. ROLAND: I will show it to him.
8 I think Mr. Cimbura is well familiar
9 with this study. In fact he testified from it at
10 the Preliminary Inquiry.

11 MR. HUNT: That was several years
12 ago. I don't know if he remembers it.

13 THE WITNESS: I recall reading this
14 study but I haven't read it very recently.

15 MR. ROLAND: Well, it is a not a
16 new study.

17 Q. It contains a value as well in
18 another infant of 643.

19 A. Yes. I am just trying - some
20 of them were autopsy and some of them were as I
21 recall it on maintenance and some of them were
22 taken while alive so I am trying to...this I believe
23 is an autopsy sample.

24 Q. All right. But the study
25 shows other values that are higher than the ones
that you found in the range of 300. It showed a
value as high as 643 and 519, but I gather what you



1
2 say is 975 is the highest that you have seen in the
3 literature?

4 A. In an infant, in a ventricle
5 of an infant, that is right, of a heart.

6 Q. And this --

7 A. In a normal - as a result of
8 normal...

9 Q. And the range between the
10 lowest fatal measure of 108 nanograms per gram and
11 the highest therapeutic level of 975 nanograms per
12 gram is really quite an extraordinary broad range,
isn't it?

13 A. It is a wide variation, that
14 is correct.

15 Q. Yes. And I gather that is
16 because of the various factors that affect the
17 therapeutic as compared to the toxic results of dig.
18 administration for various children and the various
19 variables that exist are first age I gather. That
20 is an important consideration? The younger the
infant the higher the therapeutic range you go?

21 A. In general I think that is
22 right.

23 Q. And also the clinical condition
24 may affect the therapeutic range?
25



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2

A. Such as?

3

Q. Well, such as things like

4

some renal failure and things like that.

5

A. Yes. Renal failure could have

6

caused - would result in a decreased excretion of

7

digoxin.

8

Q. Yes.

9

A. With accumulation at least in

blood.

10

Q. And it may elevate what is

11

a normal therapeutic range somewhat as a result.

12

A. In the blood.

13

Q. Yes.

14

A. That is right.

15

Q. And I presume it would

elevate it in tissue as well, wouldn't it?

16

A. Well, I haven't seen any

17

studies that have been done on this with respect

18

to heart.

19

Q. But there seems to be in the

20

literature a broad range of therapeutic values that

21

very broadly overlap the fatal values shown for

22

digoxin.

23

A. Did you say therapeutic range

24

overlaps?

25



1
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3 Q. Yes. The fatal, and it seems
4 to be a very broad overlap so that it is hard to
5 say in any individual in that broad overlapping
6 range of between 108 and 975 from simply looking at
7 the values whether or not that individual has
8 a fatal dosage of digoxin or dosage within the
9 therapeutic range.

10 A. Well, I believe you are saying
11 what I concluded that unless in fresh tissue, unless
12 you get a value that is way either outside the
13 normal range or else it is negative or very
14 extremely low, you cannot - I feel I cannot make a
15 conclusive opinion with respect to digoxin toxicity
16 from that finding alone.

17 Q. I think you studied some 13
18 control children on digoxin therapy and I found your
19 upper limit. It is 383. It is at page 18 of Exhibit
20 213. The page is titled "Digoxin Concentrations in
21 Heart Tissue in 13 Control Children on Digoxin
22 Therapy".

23 We have looked at some other studies.
24 There is one we have just discussed and it I think
25 is a study of eight children, and although there are
a number of studies they are all on fairly small
sample groups. In fact I think yours is one of the



1

2

larger sample groups.

3

A. It may well be.

4

Q. Of the ones published. So

5

that although we have ranges that are very broad

6

in the end and looking at the literature in its

7

totality we don't have results of very many children?

8

A. No.

9

Q. Do we?

9

A. That is the reason why I

10

was interested to carry out --

11

Q. Yes?

12

A. I felt it necessary to carry

13

out this research in the beginning.

14

Q. Yes. So that although we have

15

in the literature an upper range of 975 we in fact

16

have a very small population even in total, looking

17

at all the literature that we have looked at and

18

that is available. I have looked at a number of

19

studies and all the populations seem to be very small,

20

and although 975 is the upper limit that has been

21

shown to date we haven't seen through all the

22

literature a very large population of children to

23

date, have we?

24

A. Well, I am not really familiar

25

exactly how many studies. I would have to go through



1
2 the literature and find out but by now I think
3 additional studies have been published. Certainly
4 Dr. Hastreiter's group has published one recently.

5 Q. Yes.

6 A. There may have been other
7 studies published so - the paper that we have just
8 discussed seems to be - appears to me to be isolated
9 from most of the other papers with respect to the
10 very high values found in the one paper.

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Q Turning to your therapeutic ranges and your fatal toxic ranges for lung tissues; as I understood your evidence the therapeutic range that you state, first of all, between 3.4 and 30 nanograms per gram is one that doesn't come from the literature but it comes from your own studies?

A I believe so, I would have to look at it exactly, I forget whether that was our numbers, but I believe it was.

Q What is the therapeutic range if you can tell us today in the various reports that you have given us the names of this morning, is it that same therapeutic range or is it higher or lower?

A Well, in the citations that I have given this morning, are we talking about lung tissue?

Q Yes.

A I believe it is the same because I believe that is the one that I may have used, there is only one on therapeutic and I believe that is the one I may have used when I prepared my report in January of 1982. That one I believe is within the range that I found in our research.

Since that time, the Hastreiter group has published information on lung tissue.



E.2

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Q Your study on lung tissue is of
four separate infants?

4

A That is right, sir.

5

6

Q And the upper range you found was
30, and I take it that is a very small sample group
for the purposes of establishing the therapeutic range
for lung tissue, is it not?

8

9

10

11

A Well, it is a small, relatively
small number, that is right, it is useful, but the
larger the number of course the more useful it would
be.

12

13

Q Let me see if I can find it,
Case No. 4, if I can find it.

14

THE COMMISSIONER: Page 19.

15

MR. ROLAND: Q It is page 19 in
Exhibit 213 and it shows --

16

17

A Sorry, I am not sure if I have
the document, mine are not paged, I am sorry.

18

THE COMMISSIONER: Nor was I.

19

MR. ROLAND: I numbered mine for
convenience purposes.

20

21

THE COMMISSIONER: I numbered mine, it
just shows you how far ahead we are of everybody else.
I think I stopped at 19 so if you run into trouble --

22

23

MR. ROLAND: Q Case No. 4 shows an

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E.3

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interval from last dose to death of 4.5 hours. As I understand it from the evidence that we have heard so far, that is a shorter interval than is recommended for the purposes of serum digoxin testing, that you have not reached an equilibrium yet in the serum for the purposes of determining a serum level. I take it that may explain in part the 6.9 serum level that is in the next column, do you agree?

A. I don't know whether it would explain it.

Q. It might explain it.

A. There are many other factors.

Q. Yes. But it is one possible explanation I take it, is it?

A. Well, if you consider the range in blood that I have found went up to 12.4 actually.

Q. Yes.

A. So 6.9 is pretty well close to the average somewhere.

Q. Well, if you hadn't reached a steady state for Infant No. 4 in the digitalizing process that was going on there, I take it that more digoxin would move from the serum to the various tissues in the body, that is the process to reach a steady state, isn't it?



E.4

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A. Well, what I understand is the equilibrium in our steady state is when the digoxin concentrations in the blood is equilibrated, or in equilibrium with the concentrations in the tissue generally, that is right.

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Q. Yes. And so one might expect if in Case No. 4 that you had not reached equilibrium or steady state that the value for the tissues including the lung tissue may go even higher, isn't that fair?

11

12

THE COMMISSIONER: I am sorry, your question was if you had not --

13

14

MR. ROLAND: If you hadn't reached steady state yet the values are going to go down in the serum and up in the tissues?

15

16

17

THE COMMISSIONER: What you are suggesting is the process after it reaches equilibrium in the blood.

18

19

20

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MR. ROLAND: Yes.
Q. Well, in the process of getting to equilibrium through the digitalizing period until you get to a steady state, basically the values go down in the serum as they rise in the tissues?

22

23

24

25

A. Initially.

Q. Yes. Then of course digoxin is



E.5

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2 excreted, it is excreted I guess in a minor way during
3 the digitalizing process, but then the values will
4 go down both in serum and in tissue as the body
5 excretes the digoxin, and that may be overly simplified,
6 an overly simplified description, but, however.

7 A. I am not clear whether I under-
8 stand your question. But in any case I think, you
9 know, the time required to reach an equilibrium under
10 certain conditions in a tissue I haven't seen any
11 studies for that, one could generalize, but --

12 Q. What I was getting at is you may
13 have at steady state a value with respect to Infant
14 No. 4 higher than 30, if you haven't reached steady
15 state yet, and the digoxin is moving from the serum
16 into the tissues, binding to the tissues including
17 lung tissues.

18 THE COMMISSIONER: It is going down,
19 isn't it? I may be wrong. I would have thought it
20 goes down as it reaches equilibrium. It comes down,
21 because it first goes into the blood and then of
22 course it is a heavy concentration in the blood at
23 the initial point.

24 MR. ROLAND: Yes.

25 THE COMMISSIONER: And eventually it
reaches equilibrium which is the proper time for taking
the test.



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MR. ROLAND: Exactly.

THE COMMISSIONER: So presumably assuming that there is a proper time, an equilibrium time for tissue, doesn't the same process take place there?

MR. ROLAND: Q As I understand what happens, and maybe Mr. Cimbura cannot help us on this; the digoxin moves from the serum to bind to tissue and it binds in various quantities depending on the tissue that we are talking about, it binds more with heart tissue than it does with other tissue, some other tissue like kidneys and so on, or liver, or lung, but it binds at greater or lesser degrees depending on the tissue we are talking about, but it is basically moving from the serum during the digitalizing period to bind the tissue until an equilibrium is reached between the various tissue binding values and the serum; isn't that basically the process?

A. Generally I agree with you, yes, basically.

Q So during the digitalizing period up to say six or six and a half hours, you are going to have higher values in the serum relatively and lower values with tissues until you reach that equilibrium, the values with the tissue will rise



E.7

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as the values of the serum fall until the equilibrium
is reached; isn't that basically the process?

4

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A. I think my point, sir, was that
I have not seen any study where the maximum amount
of digoxin in a specific tissue, where the time was
estimated for it.

7

8

9

THE COMMISSIONER: What you are
suggesting is that as the level in the blood goes
down the level in the tissues goes up.

10

11

MR. ROLAND: Until equilibrium is
reached, that is in about six hours, I think.

12

13

THE COMMISSIONER: When is the
equilibrium reached in the tissues?

14

15

16

17

MR. ROLAND: Well, the equilibrium is
between the tissues and the serum and that equilibrium
will be different from tissue location to tissue
location because the digoxin will bind more to some
tissue than to others.

18

19

THE WITNESS: That is generally what
I would expect, yes.

20

21

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MR. ROLAND: Q. So to follow that up;
early on in the digitalizing process if an infant has
not had digoxin and a therapeutic dosage is given you
will find within the first half hour very high values,
or relatively high values in the serum and relatively



E.8

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low values in tissue during say that first half hour?

3

A. After what means of administration?

4

Q. Well, let's say it is intravenous.

5

A. After intravenous you initially find very high levels in blood.

6

Q. Yes.

7

A. And then following that there

8

will be declining and the tissues will be rising.

9

Q. Yes, exactly. Turning to your

10

report, Exhibit 95A, to begin with; I see at Note 6

11

on page 4 that a portion of T-41 was given to Dr. Wong

12

for digoxin assay, Dr. Wong being a doctor at the

13

Toronto General Hospital. Was there a result obtained from Dr. Wong?

14

A. Yes, sir.

15

Q. And what was that result?

16

A. That was 100 nanograms per

17

millilitre as I recall it.

18

Q. So that I take it satisfied you

19

that your result of 91 was a more or less accurate result, at least confirmed your result?

20

A. Well, it was consistent with my

21

result, that is right.

22

THE COMMISSIONER: Is that reported

23

anywhere?

24

25



E.9

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MR. ROLAND: I have not seen it.

3

THE COMMISSIONER: The assay of Dr.

4

Wong's?

5

THE WITNESS: I have the report, sir.

6

THE COMMISSIONER: What did you say it

was, between 90 and 100?

7

THE WITNESS: 100 nanograms per milli-

8

litre as I recall it. If you wish I could go through

9

my files and find the report and file it.

10

THE COMMISSIONER: That is 100 nanograms

11

per millilitre?

12

THE WITNESS: 100 nanograms per milli-

13

litre, that is right.

(2)

14

MR. ROLAND: Q And that was a testing

15

of a whole blood sample, I gather, as the report

16

indicates?

17

A Dr. Wong's result?

18

Q Yes.

19

A Well, I sent him a portion of the

20

whole blood, I am not aware of exactly what he did

21

with it.

22

Q Your result was done on the whole

23

blood though, wasn't it?

24

A That is correct, sir, yes.

25

Q And we know, Mr. Cimbura, do we

26



E.10

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not, from the study that we have been looking at this morning, the study authored by Gorodischer et al, of tissue and erythrocyte distribution from digoxin in infants that with respect to infants there is, there are higher values obtained for digoxin in red blood cells or erythrocytes than with plasma, isn't that right?

8

9

10

11

12

A. It is a long time since I studied Gorodischer's paper. I recall something, but I believe there are more factors than that. I believe he divided children under "maintenance" and under "digitalization".

13

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Q. Well, let's look at his paper and I am looking at page 260 and I will provide a copy of this to be put in as an exhibit.



F
BB/cr

1
2 It shows a table of maintenance
3 therapy and it shows a ratio between erythrocyte
4 and plasma digoxin for children with a mean ratio
5 of 3.62.

6 A. The mean with considerable
7 variations, that's right.

8 Q. With considerable variations
9 as high as 6.4 and as low as 1.06?

10 A. That's right.

11 Q. Yes. And what this study
12 indicates, and I gather other studies like it, that
13 you get higher values from digoxin assayed in
14 erythrocyte than you do with digoxin assayed in
15 plasma?

16 A. Well, based on this particular
17 you make it the right range.

18 Q. Yes. Well, the study shows
19 that it is never lower, it is always higher at the
20 maintenance therapy dosage?

21 A. Yes.

22 Q. Isn't that right?

23 A. That's right. I recall - well,
24 was this maintenance that we looked at?

25 Q. We're looking at maintenance.

A. Maintenance, all right. I



2
1 recall another study that was done, as I recall it,
3 on adults and the ratio there was about 1.33.

4 Q. Yes, that's right. In fact,
5 this author indicates that as well in this study
6 that the results with respect to infants are quite
7 different than the results that had been achieved
8 from studies of adults and I take it that is
9 consistent with your understanding as well?

10 A. Well, I would say one might
11 expect variations, yes.

12 Q. Yes, all right. So, for
13 instance, when we look at page 3 of Exhibit 95 and
14 we see values for Sample T27 and Sample T34 and
15 you have a value of 46 for serum and a value of
16 79 for red blood cells, I take it that relationship
17 between these two values is consistent with the
18 results obtained by Dr. Gorodischer and others in
19 studies like the one I have just shown you.

20 A. Well, part of that difference
21 could be due to that effect.

22 Q. Yes.

23 A. I am not sure of course whether
24 it is all due to that effect.

25 Q. Yes, I see. When you study
whole blood, I take it then you are doing a dig.



1
2 assay on both red blood cells, erythrocyte and serum
3 and you would expect I gather a range generally
4 higher on whole blood than you would from serum
5 alone and lower I suppose than you would from doing
6 erythrocyte alone?

7 A. Well, I am not sure if I
8 would expect it because I have recollections of
9 doing - this would appear that it could be based
10 on some literature.

3 10 Q. Yes.

11 A. But I have recollections of
12 conducting analyses in conjunction with, for example,
13 the Hospital for Sick Children where they asked us
14 to help them, or co-operate with them, where I believe
15 they use serum, as I believe it, I am not certain,
16 but this is my understanding, and I have used whole
17 blood and yet our results were lower in some instances
18 than in theirs.

19 Q. All right. Those studies I
20 take it are not something that you have presented
21 to us yet, that's not something that ...

22 A. No, I don't have a complete
23 list of the studies. I talked to Dr. Phillips. As
24 a matter of fact, he called me about it.

25 Q. Yes.



1

2

A. And apparently he has a list.

3

Q. Well, we may see that from Dr.

4

Phillips.

4

5

Dealing with Sample T11 which begins

6

on page 1 and carries over on to page 2 of Exhibit

7

95, we see values for digoxin and digoxinlike

8

substances in three tissue specimens from the heart

9

all about the same range 36, 39 and 36 and the longest

10

sample shows about the same range too of 32 and the

11

fluid seems to show about the same range of 29. I

12

gather it may be said that this generally shows an

13

equilibrium that is being established in that entire

14

solution of tissue and fluid?

15

A. Well, this could be a

16

possibility of that.

17

Q. Yes.

18

A. I seem to be aware that as

19

I recall it now again, and it is a long time ago,
but I believe that we have analysed the fluid, the
Klotz medium even subsequent to this analysis and
as I recall it it was even lower than that.

20

Q. I see.

21

A. So, this would be against this

22

theory, but judging by the numbers this could be a

23

possibility.

24

25



1
2 Q. Right. Let's deal with the
3 lungs for the moment. In theory I gather if you had
4 a solution in which you had a heart with a normal
5 or therapeutic range of digoxin in it and you put it
6 in a Klotz solution and you put a lung from, say,
7 another infant that hadn't been on digoxin and had
8 no digoxin that an equilibrium, or an attempt - I
9 shouldn't say an attempt, but what would happen is
10 that the solution would be moving towards some
11 equilibrium wherein the lung would take up some
12 digoxin, that it would move from the heart through
13 the fluid and that the fluid would lose some of that
14 digoxin to the lung which would absorb it until some
15 equilibrium was established?

5 14 A. Are you saying, sir, that if
15 you place both heart and lung into the same container?

16 Q. Yes.

17 A. And the heart had digoxin in
18 it.

19 Q. Yes.

20 A. And the lung had no digoxin
21 in it initially.

22 Q. Yes.

23 A. That's right. Is that
24 correct?
25



1

2

Q. Yes, the lung would take up
some digoxin, wouldn't it?

3

4

A. Well, it could, I don't know.
I think under those conditions certainly I wouldn't
be sure where the digoxin in Klotz solution came
from.

5

6

7

Q. I see.

8

9

A. I wouldn't be sure if I didn't
know at the beginning what had what.

10

Q. Yes.

11

12

A. I couldn't tell where the
digoxin in the Klotz solution came from, whether it
came from the heart or the lung.

13

14

Q. Yes.

15

16

A. But whether it would go back
into the lung it is a possibility but I have never
tried it.

17

18

19

20

21

Q. Well, because when I look at
these values I suppose it is possible that you could
have had a very much lower value in the lung initially
but so long as that value was lower than the Klotz
solution that it may have moved, the digoxin may
have moved from the Klotz solution into the lung?

22

23

A. I would have to speculate.
I don't know, sir. There are all kinds of possibilities

24

25



Cimbura, cr.ex.
(Roland)

1
2 and for this reason I didn't express any opinion
3 as to the minimal, estimate of the minimal heart
4 concentration with respect to Cook because of the
5 fact that the two organs were contained in the same
6 jar.

7
8 Q. I see. Do I understand it
9 correctly that with respect to Sample T11, that you
10 didn't do an HPLC on the left atrium tissue, because
11 I see that there is no concentration of digoxin
12 shown there?

13 A. That is correct, sir. There
14 was only RIA.

15 Q. And the same can be said
16 with respect to the Klotz solution, that you didn't
17 do an HPLC on that?

18 A. No, that is correct, sir.

19 Q. Yes. All right then if we
20 go to Kevin Pacsai at page 4 and in particular your
21 note about Sample T7, which is found at page 5 -
22 I am sorry, that's not the one I am looking for.
23 Well, I'm sorry, let's turn the page, a couple of
24 pages to Jordan Hines, page 6, that's the case I
25 am looking for, in which you have a note about Sample
T6. That sample contains tissue from the heart
in three locations and Klotz fluid and it appears you



1 didn't do an HPLC on the right atrium again and you
2 didn't do an HPLC on the fluid, is that correct?

3 A. That is correct, sir.

4 Q. Yes. And yet you gave in your
5 note, Note 1 about half way down page 7 that the
6 concentration of digoxin in the heart before it was
7 fixed in Klotz solution was not less than 252.
8 How can you say that, Mr. Cimbura, when you don't
9 know how much of the Klotz solution is digoxin and
10 how much is digoxinlike substances?

8 10 A. Well, I believe, sir, I went
11 into the explanation how I did that yesterday. This
12 was one of the assumptions that I assumed and is
13 stated further on at the end of this report, is that to
14 be able to do that I assumed that the digoxin, that
15 the digoxin like substances were derived from
16 digoxin.

16 Q. I see.

17 A. And the assumption is worded
18 in my report.

19 Q. I see. So, you simply treat,
20 for these purposes, digoxin and digoxinlike
21 substances as digoxin?

21 A. I assumed that the digoxin-
22 like substances were derived from digoxin.

23 Q. Right. And yet we have it,
24
25



1
2 I gather from your evidence earlier this morning,
3 that you weren't able to identify what those digoxin
4 like substances were?

5 A. That is correct.

6 Q. Now, turning back to page
7 5 and the results of Allana Miller.

8 A. Yes.

9 Q. And Note 2 on page 6 you say
10 that the values or concentrations of digoxin in the
11 heart or lung tissue were probably higher than Klotz
12 solution. Did you attempt to calculate back from the
13 measurement of the weight of the heart and lungs the
14 range or possible concentration for digoxin in the
15 heart and lungs in this case?

16 A. I haven't done that because
17 of the reason I have already stated in this instance
18 about heart and lung organs were mixed.

19 Q. I see.

20 A. In that same container.

21 Q. So, you only did that where
22 there was either heart or lung but not mixed?

23 A. Well, the heart mainly I
24 believe it was, that's right, but only one, that's
25 right.

Q. All right. Dealing with



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Estrella at page 6. You have estimated the level of digoxin in the heart at 55 nanograms per gram and we have seen that that is a low therapeutic level, in fact, it is the lower end of the therapeutic range that you have given us.

A. What I have estimated is not less than that.

- - - - -



EMT.jc

G

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2

Q. Yes.

3

A. That value by itself is quite low,
yes.

4

5

Q. Yes. Did you estimate what the
highest possible range would be or could you do that?

6

7

A. Which chart are we on now,
Estrella?

8

9

Q. Yes. You have given the lowest.
Can you give an estimation of the highest?

10

11

A. No, I couldn't - there are so
many complex factors involved.

12

Q. Yes.

13

A. That I reached a conclusion that
I could not do it.

14

15

Q. Turning to the report of February
2nd, you have given us the results of analysis of a
specimen from Allana Miller but it does not give us
the value.

16

17

18

Is there any reason for that?

19

A. As I recall it, the value was
already mentioned in the previous record. This is T29?

20

21

MR. LAMEK: Page 25.

22

THE WITNESS: Yes, I recall. In a
sense what has happened there, sir, is when the first
report was issued all we had time to do is the RIA

23

24

25



G.2

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2

test on this item. As you see if you look on page 5 --

3

MR. ROLAND: Q. Yes, I see it.

4

5

A. -- it is expressed as digoxin
and/or digoxinlike.

6

7

Subsequently after I issued a report
we had an occasion to do the HPLC analysis as well, and
conclusions from that I have reported on the report
of February 5th. February 2nd, I am sorry.

8

9

10

11

12

Q. I have one last question about
your report of April 6th. So I understand it, at the
bottom of that report you have a note that an analysis
of the sample shown in the note:

13

14

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" ... indicated the presence of
methyl alcohol and higher concentrations
of ethyl alcohol. These specimens
apparently did not contain any
preservative. Because of the unusually
high concentrations of ethyl alcohol
measured ... and because some of the
concentrations tended to increase with
time, it is suspected that these
findings are artefacts."

Now what are you referring to? Are
you referring to the findings, the alcohol findings?
You are not referring I take it to the dig. findings?



G.3

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2

A. No.

3

4

MR. ROLAND: Thank you. Those are all
the questions I have.

5

THE COMMISSIONER: Yes. Thank you.

6

Miss Kitley?

7

MS. KITLEY: I will be ten or fifteen
minutes, sir. Would it be appropriate to take a break?

8

9

THE COMMISSIONER: It would if you like.
Is that what you would like?

10

MS. KITLEY: I would appreciate it.

11

12

THE COMMISSIONER: Yes. All right. We
will take 20 minutes now.

(2)

13

--- Short recess

14

--- On resuming:

15

THE COMMISSIONER: Yes, Miss Kitley?

16

CROSS-EXAMINATION BY MS. KITLEY:

17

Q. Mr. Cimbura, like Mr. Roland I
too am interested in the ranges, and I want to deal
with the ranges which you have shown in Exhibit 95.

18

19

Do you have a copy of that exhibit in
front of you? That is your report.

20

21

A. That is my report. Thank you.

22

Q. On page 4 of Exhibit 95A --

23

A. Yes.

24

25

Q. I would like to deal with Note 2



G.4

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which indicates a range for blood in fatal poisoning of 13.8 to 200. Right?

A. That is right.

Q. Do you have a range for therapeutic for blood in serum?

A. Do I have a range?

Q. Yes.

A. As therapeutic?

Q. If fatal starts at 13.8 --

A. Oh, I see.

Q. -- can we assume everything below that is therapeutic?

A. Well, according to research carried out at the Centre the range which I have attempted to illustrate is up to 12.4.

Q. What happens --

A. Possibly up to 12.4.

Q. What happens between 12.4 and 13.8?

A. Well, I am not sure I understand your question as to what happens between there.

Q. What I am getting at and maybe it will be easier if we go to the next one which is the heart muscle, Note 3, and in that case you have two ranges. You have the therapeutic range which is 49 to 975, and you have the fatal range which is 108



G.5

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2

to 1240. Right? Are you with me?

3

A. At that time, that is right.

4

Q. Well, we are dealing with your
report.

5

A. That is right.

6

7

Q. So you then start at 49 and carry
on with the whole range up to 1240.

8

9

What is between 1 and 48? Just as in
the blood what is between 1 and 13.8?

10

11

A. Your question is clear but I am
not really sure that I know what I should answer to it.

12

13

Q. Well, let's do it another way
then, Mr. Cimbura.

14

A. These ranges are experimentally
determined.

15

16

17

18

Q. All right. But in each of the
heart and the lung and over on page 7, Note 2, in
the cases of liver, you have provided us with
therapeutic ranges and fatal poisoning ranges.

19

20

A. That is right. Based either on
the research or on reported research, reported --

21

22

Q. Exactly, but in the case of blood
you have given us only the fatal, so I am interested
to know what the therapeutic is for the blood?

23

24

25

A. For postmortem blood that is the



G.6

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2

range that I have given on one of the documents that
you have seen yesterday.

4

5

Q. I just want to complete this
absence - what appears to me to be an absence from the
report.

6

7

Can you tell me how what figure I
should be using for therapeutic for blood in conjunction
with Exhibit 95?

8

9

10

11

12

A. Well, from my research in infants
and children the highest - the range that I have found
was between negative values and the highest value of
12.4 for children that were on therapy.

13

THE COMMISSIONER: A value of what did
you say?

14

THE WITNESS: Pardon me?

15

THE COMMISSIONER: This value was what?

16

THE WITNESS: 12.4.

17

THE COMMISSIONER: 12.4?

18

THE WITNESS: That is what I have found
myself.

19

20

21

22

MR. HUNT: I am afraid I wasn't
following the question exactly but my friends at the
table point out Note 1 on page 3 that may or may not
relate to the question which is being asked.

23

24

25

MS. KITLEY: Q. Well, have you got



G.7

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Note 1 on page 3, Mr. Cimbura?

3

A. Yes.

4

Q. The difficulty I have with that,

5

sir, is that therefore means there is a gap between

6

9.7 and 13.8.

7

A. There may be a gap, yes. Just

no data experimentally produced in that.

8

Q. Well --

9

A. Usually in forensic toxicology

10

work there is usually some sort of an overlap in these

11

ranges.

12

Q. For purposes of what I want to

13

do I am going to take the figure you just gave me

14

which is negative or for my purposes zero to 12.4,

15

and what I have done, Mr. Cimbura, and I don't know

16

whether you can see it from here?

A. No, I cannot.

17

Q. Well, you won't need to. Well,

18

no, because you have got your report in front of you

19

and I just want to illustrate for the moment if we

20

are dealing with blood, heart, lung and liver, you

21

have got therapeutic and fatal ranges. Right?

22

I have now stuck in under therapeutic

23

for blood and serum the range of zero to 12.4, and

24

under fatal I have got 13.8 to 200 which would you

25



G.8

1

2

agree with me is right out of page 4 of your report?

3

A. Yes.

4

Q Under heart I have got under
therapeutic 49 to 975.

5

A. Yes.

6

7

Q And under fatal 108 to 1240
which is right out of page 4 of your report?

8

A. Yes.

9

10

Q Under lung, 3.4 to 30 for
therapeutic and 4.2 to 100 for fatal which is right
out of page 4 of your report.

11

12

On liver I have got 2.1 to 190 under
therapeutic and 35.3 to 580 for fatal which is right
out of page 7 of your report.

13

14

Now are you with me so far?

15

A. Yes.

16

17

Q Okay. Now, as Mr. Roland pointed
out there is a tremendous overlap between these
ranges and so --

18

19

A. Between some of them. I am not
sure if it is all of them, but some of them.

20

21

Q Well, I was going to use it as
an example. Let's say you show a heart measurement
of 100 - or, let's make it 125. All right. Now, that
125 falls at the low end of the therapeutic range and

22

23

24

25



G.9

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also at the low end of the fatal range so that one figure of 125 can be in either classification?

3

4

A. That is correct.

5

6

7

Q. And to use another example with respect to lung, if we were to choose 5, then that is at the low end of the therapeutic range and also at the low end of the fatal?

8

9

A. In blood, in postmortem blood.

10

11

Q. In lung.
A. Lung? Would you say that again?
The low end?

12

13

Q. Your range is 3.4 to 30.

A. That is right.

14

15

Q. So if I am choosing 5 hypothetically.

A. Yes.

16

17

Q. Then that is at the low end of

the therapeutic and at the low end of the fatal?

A. That is right.

18

19

Q. And whether you call it therapeutic or fatal it is just a choice that one makes?

A. No, it is not a choice.

20

21

Q. Well, it fits within both categories?

22

23

24

25

A. That is right, it fits into both, but it is not a choice. It is an experimentally determined value.



G.10

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Q But it is the same 5, right, just using my 5 on lungs for now. Let's say your measurement says 5.

In one breath I can say that that is the fatal measurement and in the next breath I can say that that is a therapeutic measurement and I am right in both breaths?

A. It fits --

THE COMMISSIONER: Except that one child died or at least one person apparently died from it and one who didn't.

MS. KITLEY: I am talking about ranges.

THE COMMISSIONER: Yes, you are quite right. I understand. I understand what you are saying.

MS. KITLEY: Q For purposes of plugging my hypothetical 5 I can plug it into either fatal or into therapeutic. Would you agree?

A. It fits into both, that is right.

Q It fits into both, yes. And if it is lung and if it is 3.1 it has to go into therapeutic. Or if it is lung and it is 35 it has to go into fatal. But I am talking about those overlapping figures.

A. That is right.



G.11

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2

Q. Right?

3

A. There is an overlap.

4

5

Q. So can we assume from this point that my hypothetical 5, it can go into either fatal for lung or therapeutic?

6

7

MR. HUNT: We can assume that only for the purpose of this discussion about the ranges.

8

MS. KITELY: Yes.

9

10

11

12

MR. HUNT: If my friend is going to take it farther which it sounds like she is with this reference to hypothetical, we have got to be sure that the very first step is just restricting that assumption to this discussion about ranges.

13

14

MS. KITELY: Everything I am talking about is in the context of ranges.

15

16

THE COMMISSIONER: I am entirely with you on everything you have said so far.

17

MS. KITELY: All right.

18

19

THE COMMISSIONER: It is the next step we are going to have trouble, but you go ahead.

20

MS. KITELY: I hope we won't have trouble with it.

21

22

Q. Now I don't think I got an answer from Mr. Cimbura although I did from Mr. Hunt.

23

24

25

THE COMMISSIONER: Can I answer, can



G.12

1
2 I agree with you? No, you would rather have it from
3 him?

4 MS. KITELY: I would rather have
5 Mr. Cimbura agree with me if you don't mind, sir.

6 THE WITNESS: Your last reply was that
7 5 fits into either the therapeutic or the fatal range,
8 that is right, it does.

9 MS. KITELY: Q Okay. Now, let's go
10 a little bit further. Would you agree with me in the
11 context of your report not only did you examine each
12 of those four but you examined bowel, stomach fluid,
13 vitreous humor, chest fluid, right side, skin, brain
14 and tongue. Would you agree with me?

15 A. Examined as part of the case,
16 examination of the children under investigation? Is
17 that what you are referring to?

18 Q Yes. In 95 --

19 A. Not in my research, but you are
20 referring to the children under investigation.

21 Q I am only talking about 95, so,
22 yes, the children under investigation, and I am
23 suggesting to you, and quite frankly I have read your
24 report, the other pieces of tissue that you looked at
25 and the other fluid are those which I have just listed?

A. Yes.



G.13

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2

Q Right. Would you agree with me?

3

A. That I have examined other tissue

4

other than what you have put on your paper there?

5

Q Yes.

6

A. Yes.

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H/DM/ak

Q. Yet, and the only ranges that we have, from what I can tell by Exhibit 95, are the four ranges that I put up here.

A. Well, that is what you have, I may have additional information.

Q. Well, just to satisfy me, am I correct that Exhibit 95 does not contain ranges for any of those other items?

A. My report does not contain what?

Q. Ranges for anything but those four.

A. Well, if you say so, I would have to go through it to refresh my memory.

Q. Well to be fair to you, Mr. Cimbura, the only place where there might be a range, and I say might be ---

A. I think there is one on skin there isn't there somewhere.

Q. Would you look at 95E?

A. What page is that?

Q. I don't know the page, it is the September 29th report, so it is the second last one.

A. Thank you.



H2

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Q. If you look at page 2.

A. That's right.

Q. In Note 1 it reads that from the liver a fresh autopsy specimen, they were in certain ranges. But, if you look at those, Mr. Cimbura, there are only three ranges there, the rest are just single figures; and so skin - would you agree with me --

A. Pardon me?

Q. Would you agree that on page 2 of the September 29th report, Note 1, there are seven items and only three of them have ranges?

A. Whenever there is more than one case there are ranges, that is right, for the single item there is only one case I based my conclusion on that.

Q. Well, looking at page 2 of 95E, the heart, you show one case and you show a range.

A. No, that wasn't meant to be - as I recall it in one literature report the value found in a poisoning range between 100 and 200 as I recall it.

Q. What I am trying to get at, Mr. Cimbura, we have got these ranges, blood, heart, liver and lung, right?



H3

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A. Yes.

4

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Q. And my question to you is do we have ranges for the other tissue that you looked at; you mentioned skin. Now if we look at Exhibit 95E.

7

A. Yes.

8

9

Q. You have a figure for skin but it is not a range.

10

A. No, because there is only one case reported in the literature.

11

12

Q. Right, so we don't have a range for skin, right?

13

A. You say "we", including me?

14

15

Q. I am saying this Commission at 11:45 on October the 20th doesn't have before it a range for skin.

16

17

A. Well, there may be ranges in the literature.

18

19

Q. Are you equipped to tell us at this moment what the range would be?

20

A. For skin?

21

Q. Yes.

22

23

24

25

A. If I could - I may have some note in my notes if I could refresh my memory on that and perhaps I could tell you.



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Q. Would you look.

4

5

THE COMMISSIONER: Well, what does this involve, are these present here, are you talking about - or have you something present here?

6

7

THE WITNESS: I may have a summary of values, sir.

8

THE COMMISSIONER: Yes.

9

THE WITNESS: I am not sure if I have it with me or not.

10

11

MR. KITLEY: Q. I have a simple way to do it, sir.

12

13

14

A. As I recall the literature there is a therapeutic range for skin, not by work that I have done but by some other group, I don't recall the exact detail of the range.

15

16

17

18

Q. Mr. Cimbura, without having to pull your whole file apart, or whatever, I would like to do it in this fashion; we know we have four ranges.

19

A. That is correct.

20

21

Q. And we know that there are about six or seven other things that you looked at,

22

A. Yes.

23

24

25

Q. That we don't at our fingertips have ranges for. I mean you either have to look



H5 1
2 through your file or go back to your office, neither
3 of which I want you to do.

4 A. That's right I don't recall
5 them right now but there are other ranges and some
6 of them I may have available in my office, that's
7 right.

8 Q. Well, we just want to get
9 through evidence this morning so we are not going
10 to get you to do that. We have four with ranges.
11 What I am going to ask you to do for the moment is
12 to ignore those for which we don't have ranges and
13 I will come to an illustration of that in a moment.
14 In your report you also refer to some substances,
15 such as digoxin, embalming fluid and IV fluid, right?.

16 A. It is mainly in the Klotz
17 medium, yes, oh yes, in the Klotz fixed specimens?

18 Q. No, I am talking about your
19 separate examination of things such as embalming
20 fluid, you did that on several occasions?

21 A. We analyze that by RIA, that's
22 right.

23 Q. The point is that other than
24 tissue and blood you analyzed certain products from
25 the fluid in the IV line to the embalming fluid, is
that right?



H6

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A. That's right.

Q. Now am I also correct from your evidence yesterday that where you have two values for the same piece of tissue, and one is on RIA and the other is on HPLC, that as far as you are concerned the HPLC is more reliable.

A. The HPLC result enhances my confidence in the RIA result.

Q. But having separated the material isn't it ---

A. The results are consistent.

Q. But if the RIA said 100 and the HPLC said 80, didn't I understand you to say that you had more confidence in the 80 because of the separation process?

A. Yes, that's right with respect to certain specimens.

Q. All right.

A. That I had other information about as well for that.

MS. KITELY: Now, Mr. Commissioner, at the risk of being very tedious, and I am going to tell you where I am going before I do it.

I would like to review the report that is 95A through F, and I am going to ask Mr. Cimbura



1
2
3 to allocate with me the blood, heart, lung and
4 liver specimens that we have in either therapeutic
or fatal.

5 THE COMMISSIONER: This is a
6 mathematical exercise, we can all do it, can we not?

7 MS. KITELY: Well, it is, and I
8 have done it.

9 THE COMMISSIONER: Could you not
10 just tell us what it is rather than have him go
through this exercise if you have done it?

11 MS. KITELY: I can certainly do
12 that, but before I do that I had best lay a couple
13 more ground rules then.

14 THE COMMISSIONER: All right.

15 MS. KITELY: Q. Mr. Cimbura, can
16 I ask you to go to Exhibit 95. Mr. Commissioner,
17 perhaps what I will do if I can do the Cook child
18 as an illustration of how I have done the mathematics
for the rest.

19 THE COMMISSIONER: Yes, all right.

20 MR. HUNT: Does Mr. Cimbura have a
21 pencil?

22 MS. KITELY: He would probably like
23 a pencil, yes.

24 Q. Now, because the information
25



1
2 we had is, we have therapeutic and fatal, and because
3 there are gaps; in other words, there is a gap
4 between 12.4 and 13.8, I have established another
5 little chart for purposes of classification. What
6 this means is I am going to be classifying with you,
7 if you will agree with me, under five categories;
8 less than therapeutic; therapeutic; less than fatal;
9 fatal; greater than fatal, and greater than fatal
10 for example is 200 in blood. Are you with me,
11 Mr. Cimbura?

12 A. Less than therapeutic is
13 below that range.

14 Q. That was before you gave me
15 0 to 12.4 quite frankly.

16 A. Yes.

17 Q. Now let's deal with Cook.
18 So for example on T40 and T41 you show blood at 91
19 nanograms, and we are going to put that in the
20 "fatal" category?

21 A. That is right.

22 Q. The next is "tissue" at 1177,
23 specimen T42 and we will put that in the "fatal"
24 category.

25 A. For heart tissue?

Q. Yes. The next is tissue from



H9

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the lung T43 at 153 and we are going to put that in the "over fatal" because the top of the range is 100; are you with me?

A. According to previously mentioned ranges this is a different range now.

Q. I am talking about your report and the ranges that we have.

A. There is a different range now, I don't know what the point is.

Q. Can we just follow this through, Mr. Cimbura?

A. Yes, okay.

Q. On the next page under the "heart ventricle" Item T11A; now, as I indicated earlier where you have an RIA and HPLC, since you feel that the HPLC is more reliable I am relying on the HPLC figure. So to use the ventricle for an example, while you show 36 on your RIA you show 8 using HPLC. So I am taking that H from the ventricle and putting it right in the middle of therapeutic.

A. It doesn't make any sense at all, there is no range for that, there is a different range for that entirely.

MR. LAMEK: Fixed tissue.

MS. KITELY: Mr. Commissioner, I can



H10

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only listen to one person at a time.

3

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THE COMMISSIONER: I know, but the answer was, and I am trying to find out, there is no range, what did you say, Mr. Cimbura?

5

6

THE WITNESS: We are dealing now with fixed specimens.

7

8

THE COMMISSIONER: Yes.

9

THE WITNESS: So whatever range there is is entirely different from fresh autopsy specimens.

10

11

THE COMMISSIONER: I see.

12

MS. KITELY: Q. All right. So that the range that we talked about, each of the ranges that we have here for heart, lung and liver are different from the range for - that we should use for the ventricle, is that what you are saying?

13

14

15

A. Ventricle fixed.

16

17

Q. Fixed, yes.

18

A. That's right, there is a different specimen, differently treated specimens.

19

20

Q. I appreciate that, Mr. Cimbura.

21

THE COMMISSIONER: Let me get that range, page?

22

23

MR. LAMEK: Page 4.

24

MS. KITELY: Q. Now, the ranges are on page 4, sir.

25

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H11

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THE COMMISSIONER: I take it that concentration in the heart muscle and those are fresh samples, is that it?

THE WITNESS: That is correct, sir.

MS. KITELY: Q. And this other one is - these are all, these were all in a plastic container and these were all in the solution, this Klotz solution is that it?

A: That is correct, sir. For those, any range you would have to use a range that I presented on the document yesterday, you remember that document for fixed tissue that I conducted a study and there is some sort of a range there.

Q. You mean Exhibit 213, is that what you mean, Mr. Cimbura?

A. I am not sure, if you will show it to me.

Q. Exhibit 213, is that what you are talking about?

A. No, the comparison of the ---

Q. Are you talking about page 13 in Exhibit 213?

A. That is right. You see that gives you the findings that we found from hearts



H12

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that had been placed into Klotz solution.

3

Q. Are you saying on page 14 --

4

A. Well those are just regions of
the heart.

5

6

Q. Right.

7

A. The first one would be more
applicable for the range I suppose, if you wanted
to combine a range you could combine them both I
suppose.

10

11

Q. Well help me, Mr. Cimbura,
these don't give ranges, they give numbers.

12

THE COMMISSIONER: To show the
difference between Klotz fixed solution.

13

14

THE WITNESS: If you take the lowest
from the highest you will have a range, I believe
the highest is something like 11.

15

16

MS. KITLEY: Q. 11.0, yes.

17

A. And the lowest I forget what
it is.

18

19

Q. Is 3.1?

20

A. Yes.

21

Q. Negative to 11.

22

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THE COMMISSIONER: What page are we on now?

MR. KITELY: Page 13, Exhibit 213.

THE COMMISSIONER: Oh, the heart, the region, oh, yes. Yes, 11 - negative to 11, yes, all right.

MR. KITELY: Q. That negative to 11, sir, that is the therapeutic range?

A. That is obtained on children on therapy, that is a therapeutic range, that's right.

Q. Okay. Well then to go back to where I was on Cook, are you with me again on page 2.

A. Yes.

Q. You've got T11A, ventricle using HPLC, you've got the concentration of digoxin was 8.

A. Yes.

Q. Which we can put in the therapeutic level because you have just told me that the range is negative to 11?

A. Not really, you are comparing an HPLC result with the ranges obtained by RIA.

Q. I appreciate that.



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A. So, you cannot compare the

3

two.

4

Q. Because No. 13 says RIA.

5

A. So, you cannot compare the two.

6

Q. So, we have no ranges for

HPLC, is that what you are saying?

7

A. On Klotz fixed tissue, that's

8

right. Well, there may be a range if you go through

9

my report and combine whatever values are mentioned

10

in there.

11

Q. Which report, 213 - Exhibit

12

213 or 95?

13

A. Oh, my 95, I believe.

14

Q. And you are saying that some-

where in 95 there might be ranges for fixed tissue

15

using HPLC?

16

A. That's right.

17

MS. KITELY: Well, Mr. Hunt, can you

18

assist us, I haven't found it.

19

MR. HUNT: No, this wasn't my idea.

20

I suppose the only way I could offer any assistance

21

would be to suggest that some time may be taken

22

outside of the witness stand where Miss Kitely can

try and figure out these ranges.

23

THE COMMISSIONER: I wonder, Miss

24

25



3
1
2 Kitely, if you can tell us what it is all leading
3 to. What are you going to do. Just simply to tell
4 us -- if the sole purpose is to say that there is
5 no certainty about tissue measurements and that there
6 is no certainty as to what they, speaking for them-
7 selves alone, what they indicate, as to whether the
8 child has died of digoxin poisoning or not, I don't
9 know that you would quarrel with that, would you,
10 Mr. Cimbura. If you were given that tissue only,
11 would you be able to tell from that test?

12 THE WITNESS: No, I wouldn't quarrel
13 with that, sir, no.

14 THE COMMISSIONER: Is that the point
15 that you are seeking to establish because I don't
16 think that anybody has claimed that. They are
17 confirmatory at best of the blood test. Did I state
18 it correctly?

19 THE WITNESS: That is correct, sir.
20 Blood values are, I consider most significant tissues,
21 fresh tissues as supportive evidence only. Fixed
22 tissue is mainly inconclusive.

23 THE COMMISSIONER: Yes.

24 THE WITNESS: Embalmed tissues mainly
25 inconclusive, that's right.

MS. KITELY: Q. Well, that wasn't



1
2 exactly where I was going, sir. The direction of
3 which I was going was to establish that there are
4 by far a majority of the items referred to in Mr.
5 Cimbura's report in the therapeutic range than in
6 the fatal range.

4 6 What I suggest, sir, is because this
7 information will become significant not so much with
8 Mr. Cimbura, as I feel he is laying the ground work,
9 but for the pharmacologists.

10 THE COMMISSIONER: Yes, but whatever
11 it is, isn't it apparent without cross-examining him
12 on it?

13 MS. KITLEY: Well, except that it
14 requires certain value judgments that I expected that
15 he would want to reiterate. I am prepared not to
16 flog the horse, sir, and I am quite content if Mr.
17 Cimbura would be available so that I could work out
18 this information so that I would have it for another
19 witness. Then, I will leave the topic and get on
20 with one of my friends for cross-examination.

21 THE COMMISSIONER: Well, I don't want
22 you to leave it. If you have got something you want
23 to prove I don't want you to leave it if you can
24 only prove it by Mr. Cimbura.

25 But the report is there, is toxic



1
2 and non therapeutic ranges such as they are are
3 there, but I think you have to be careful that you
4 are not comparing, as the cliché has it, apples and
5 oranges.

6 MS. KITELY: I agree, sir.

7 THE COMMISSIONER: Certainly a great
8 many of these readings are in both therapeutic and
9 toxic ranges, some of them are within the toxic
10 range, some of them are within the therapeutic range.
11 The real problem is that they don't prove an awful
12 lot wherever they are.

13 MS. KITELY: I'm sorry I didn't hear
14 you, sir.

15 THE COMMISSIONER: They don't prove
16 a great deal wherever they are.

17 MS. KITELY: Well, it is something
18 that I would like to sort out, sir.

19 THE COMMISSIONER: All right.

20 MS. KITELY: And long as I can take
21 up Mr. Hunt's suggestion and meet with Mr. Cimbura
22 to sort out these details I would be pleased to
23 conclude my cross-examination because that's what I
24 wanted to deal with.

25 THE COMMISSIONER: Is that possible
that that could be arranged, Mr. Hunt?



1
2 MR. HUNT: I think that's quite
3 possible, yes.

4 THE COMMISSIONER: Yes, all right.

5 MS. KITELY: Thank you, sir.

6 THE COMMISSIONER: All right. Then,
7 Miss Jackman.

8 CROSS-EXAMINATION BY MS. JACKMAN:

9 Q. Mr. Commissioner, I think
10 Miss Kitley's direction in cross-examination was
11 important and I would hope that if she can sort this
12 out with Mr. Cimbura over lunch that it does go on
13 record this afternoon because I myself was intending
14 to follow up on some of the questions, we discussed
15 it on break.

16 THE COMMISSIONER: Well, you had
17 better get in on the conference. Would you like
18 to get in on the conference?

19 MS. JACKMAN: Well, I think it is
20 information that the other counsel should know as
21 well.

22 THE COMMISSIONER: Well, no, no, but
23 you get in on the conference and then if you want
24 to, this afternoon - I don't know how we can do
25 it. It is not for the purpose of suppressing evidence
it is for the purpose of some day getting out a



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report. I don't want to call witnesses back all the time and if it is possible, and I am not suggesting any impropriety that you have lunch with Mr. Cimbura or something like that, but if you do manage, if you don't mind to get it out of the way so that whatever has to be asked can be asked this afternoon and he won't have to come back, that's all.

MS. JACKMAN: Yes, sir.

THE COMMISSIONER: So, on that basis, did you have some other questions you wanted to ask?

MS. JACKMAN: Most of my questions follow from what Miss Kitely was going to ask.

THE COMMISSIONER: Well, why don't we put you and Miss Kitely on at the end of the show and see what has happened by that time and we will see.

Now, Mr. Olah, are all your questions along the same line too?

MR. OLAH: No, sir.

THE COMMISSIONER: Good.

MR. OLAH: May I volunteer then to go next?

THE COMMISSIONER: Yes, all right.

MR. OLAH: Thank you.



Cimbura, cr.ex.
(Olah)

1840

CROSS-EXAMINATION BY MR. OLAH:

THE COMMISSIONER: We have certainly almost without your consent or anything else we seem to be throwing you to the lions. Are you happy to give a little time to these ladies?

THE WITNESS: I would be happy. I had another commitment but I feel now that I should cancel the other commitment and I believe I will, I will do that.

THE COMMISSIONER: Can you do that?

THE WITNESS: Yes.

THE COMMISSIONER: Is it someone who will forgive you for that?

THE WITNESS: I am sure.

THE COMMISSIONER: Yes, all right.

MR. OLAH: Mr. Cimbura, I think you have already indicated this morning that the toxic range as far as you are aware of with respect to blood, and I take it that is from the literature, is from 13.8 nanograms per millilitre to 200 nanograms per millilitre. Is that the range?

A. Well, as far as I am aware of right now I have even found one a little lower value. That's the range I have used in my report.

Q. And that's the highest range



1
2 that's reported in the literature?

3 A. The value of 200?

4 Q. Yes, sir.

5 A. Yes, up to 200.

6 Q. And have you ever experienced
7 yourself in your research anything higher than 200?

8 A. No, I haven't done research on
9 fatalities.

10 Q. Would it be surprising to
11 find a level, say, in the four, five hundred range,
12 would it surprise you?

13 A. Yes, it would surprise me to
14 some degree. It is higher than what was reported
15 in the literature.

16 Q. Well, you do remember, do
17 you not, sir, that in Exhibit 95-C you did in
18 fact report a level of 491 nanograms, did you not,
19 sir?

20 MR. TOBIAS: Which page?

21 MR. OLAH: It is 95-C. It is dated
22 March 25th, 1982 and it relates to the child Inwood.

23 A. My Item T46?

24 Q. That's right, T46.

25 A. That's correct, sir, 491.

Q. Are you surprised that your



10 1
2 HPLC and RIA combination there yielded a result of
3 almost 500 nanograms?

4 A. Well, I am not surprised about
5 the RIA and HPLC, I am not surprised about that.

6 Q. Well, are you surprised by
7 the result?

8 A. The result is 491, that's
9 right.

10 Q. The question I have is, are
11 you surprised by the result?

12 A. Well, it is higher than reported
13 in the literature.

14 Q. Would that tend to suggest to
15 you either some artefact or some error in yielding
16 such a high result?

17 A. It's difficult to answer that
18 because, you know, the literature reports, as far as
19 I can recall, only about 9 in cases of fatal poisoning.
20 So, that is a relatively small sample, there just
21 haven't been that many poisonings by digoxin cases
22 in children reported in the literature.

23 Q. Well, a few minutes ago when
24 I asked you whether you would be surprised by a
25 finding of over 200 you said you would be?

A. I said to some extent by the



Cimbura, cr.ex.
(Olah)

1843

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2 mere fact that it is above the reported fatal range,
3 that's right.

4 Q. Would you not agree with me,
5 sir, that this result seems to suggest some sort of
6 a deviation, either contamination or error to yield
7 such a high result?

8 MR. HUNT: He has just answered the
9 question, Mr. Commissioner. The very same question,
10 it is difficult to say because of the fact the
11 literature was based on so few cases.

12 THE COMMISSIONER: Yes, but I think
13 the question now is, would this suggest to you that
14 there might be some contamination that would cause
15 that.

16 MR. HUNT: Well, the question that
17 came before that suggested some error or artefact.
18 Surely we are really dealing with the very same
19 suggestion to the witness.

20 MR. OLAH: Well, I just want to get
21 a clear answer so I know what this witness is saying.

22 THE COMMISSIONER: Well, I think it
23 is all right, you go ahead, Mr. Olah.

24 MR. OLAH: Thank you.

25 Q. Do you remember the question,
Mr. Cimbura?



12 1
2 A. Would you mind repeating it
3 again.

4 Q. Simply, the question was,
5 does this very high level that we have here suggest
6 that it is either an artefact or error in testing?

7 A. That it is either an error
8 in testing?

9 Q. Or an artefact or contamination.

10 A. Or a artefact or contamination.
11 Again, I will say it is difficult to answer because
12 perhaps you will have 50 cases of poisoning reported
13 in the children it would be much clearer to answer
14 that.

15 Q. I see. So, your answer is you
16 don't know, you can't say?

17 A. It makes one think of this
18 possibility but I'm not really sure whether, you know,
19 whether the possibility that there is something
20 unusual, but I don't really believe that it suggests
21 it by itself unless there is some other information
22 available.

23 Q. Okay. By the way, did you
24 make - I assume when you did get this result you were
25 surprised?

A. To the extent that it is higher



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than was reported.

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Q. And I assume that you made some enquiries in regards to that very unusual finding?

5

6

A. Well, I'm not sure what you refer to as I made enquiries.

7

8

Q. Well, did you make enquiries about the source of the sample?

9

10

A. I made at one stage or the other. I'm not sure whether I made it at the beginning or after, I'm not quite sure.

11

12

Q. All right. And your information as to the source was that it was a post-mortem sample of serum?

13

14

A. That is correct. The source of the information said that the serum was subjected to - it was heated for a certain period of time at a certain temperature, that's right.

17

18

Q. Do you know for what purpose the serum was collected?

19

20

A. I don't know for sure.

21

Q. Well, did you make enquiries?

22

A. I believe I may have made them and I seem to recall some answer that it had to do something with virology testing but I'm not sure

23

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whether my recollection is complete at that time.

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Q. Would you have a note of that,
Mr. Cimbura, somewhere?

5

6

A. I'm not sure whether I have
or not.

7

8

9

Q. Would you possibly check and
let Mr. Hunt, your counsel, let us have the results
of your search because, as you can appreciate, that
is a fairly critical reading?

10

11

A. Oh, it is a very high reading,
yes.

12

13

Q. All right. Could you make
those searches, please.

14

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16

A. Well, I can, but you know,
it is only based on reports. I think you should
trace the source of the sample and let them decide
who, where it was collected.

17

18

19

Q. You exactly anticipated my
question of Mr. Lamek. Perhaps Mr. Lamek can assist
us in that regard.

20

21

MR. LAMEK: I would do that merely to
point to the Hospital. Maybe Mr. Roland can answer
that.

22

23

24

25

MR. OLAH: I wonder who Mr. Roland is
going to have to point to.



1
2 MR. LAMEK: I don't know.

15 3 THE WITNESS: Well, I hope you
4 appreciate what ---

5 THE COMMISSIONER: It is information
6 about the 491 but you didn't do the testing. You
7 are on page, it is Exhibit 95-C, page 1?

8 MR. OLAH: Yes.

9 MR. ROLAND: Yes.

10 THE COMMISSIONER: And the reading
11 is 491 and is on Kristin Inwood, blood.

12 MR. ROLAND: Yes. As I recall, Dr.
13 Ellis did testify about a sample from Kristin Inwood
14 that he did heat and this is, I presume, where Mr.
15 Cimbura got his information.

16 THE WITNESS: Yes, that I have recorded,
17 the heating I have recorded.
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MR. ROLAND: I can't recall now whether Dr. Ellis gave us a value for that sample of his testing or not, but I will look and see if I can find it.

MR. OLAH: It is not so much the value; I am interested in to know how the sample was taken, for what purpose, and when it was taken, so that we can establish what kind of a sample we are dealing with. It is a critical piece of evidence, Mr. Commissioner.

MR. LAMEK: My recollection, Mr. Commissioner, and I think I can check this, is that the sample was originally found in the Hematology Department and therefore was presumably drawn for some hematological purpose. Whether anyone at this stage recalls the circumstances of the drawing of the sample, I clearly do not, and perhaps in that respect Mr. Roland could make enquiries.

MR. OLAH: I would be grateful.

MR. LAMEK: That is as much as I can help my friend.

THE COMMISSIONER: The enquiry is about to take place, I think.

MR. OLAH: I am grateful for your help, Mr. Commissioner.



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Q. A couple of other problems I had in going through your report, sir, if you would be good enough to turn to T40. That is Exhibit 95A which is on page 1. That is a blood sample as I understand it in which you got a result with respect to the Baby Cook 91 nanograms.

A. That is correct.

Q. And as I understand it that was the sample that was forwarded by Dr. Cutz.

A. That is correct, sir.

Q. And when the Hospital, as I understand it, tested that very same sample, turning to Exhibit 116, Mr. Commissioner, at page 57, my understanding is that their results resulted in a reading of in excess of 100.

Would the difference between those two readings --

THE COMMISSIONER: 116? Where do I find that?

MR. OLAH: Page 57, Exhibit 116. That is the Cook chart.

As I recall that sample was taken at about 10:00 a.m. by Dr. Cutz and it is a sample from Pathology.

THE COMMISSIONER: Page 57?



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MR. OLAH: Clinical chemisty interim
report, sir.

4

5

THE COMMISSIONER: Yes, I have it.
What column was it in?

6

MR. OLAH: It would be no time, sir.

7

8

THE COMMISSIONER: No time, and it
is the second column?

9

MR.OLAH: Second column.

10

11

THE COMMISSIONER: How do you know
that is the same - I am sure that you are right but
how do you know?

12

MR. OLAH: I think Dr. Cutz testified --

13

14

THE COMMISSIONER: That it was the
same one?

15

16

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18

MR. OLAH: Yes, because you will
recall that the autopsy was performed that morning
and started I think around 9:30 or 10 o'clock, and
you will see all of the samples are taken earlier
than 10 o'clock.

19

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THE COMMISSIONER: Well, I have no
doubt you are right, but why do you concentrate on
that one, D57978? Is it because of something
Dr. Ellis said?

23

24

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MR. OLAH: I am concentrating on it
because it is the very same sample as tested



J4

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at the Hospital for Sick Children, and it was tested
by the Centre.

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THE COMMISSIONER: I am being a
little dense. How do you know it is the same
sample?

6

7

MR. OLAH: Well, as I understand it,
Dr. Cutz at autopsy --

8

9

THE COMMISSIONER: Yes.

10

MR. OLAH: -- took some sample
of blood which was then analyzed.

11

12

THE COMMISSIONER: And so it is
because of the reference to Dr. Cutz?

13

MR. OLAH: That is correct, sir.

14

15

THE COMMISSIONER: Now is the one
that he took, which is the second column on page 57,
has that been established it is the one he took?

16

17

MR. OLAH: I believe that is what
the evidence indicated. That is my recollection.
But no matter which sample we take, whether it is
column 2, 3 or 4 you will see that there is disparity
between those readings and the readings taken at the
Centre.

21

22

All I am trying to ascertain is whether
the difference for that or the explanation is
because Mr. Cimbura was using HPLC in combination

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J5 1
2 with RIA, whereas I believe the Hospital was simply
3 using RIA. I just want to understand why there are
4 different readings for what appears to be the same
5 sample of blood.

6 MR. HUNT: My only concern is that
7 if that is the question - and I see my friend's
8 problem - we have to know precisely whether it is
9 the same sample. There is no point in asking
10 Mr. Cimbura to comment on that precise question
11 unless we have it verified by the evidence of
12 Dr. Cutz that it is the same.

13 THE COMMISSIONER: Well, we may
14 have had that; I just don't remember it. I was
15 hoping that Mr. Olah could point to something that
16 would identify which one - in any one of these
17 cases there is a difference.

18 MR. OLAH: Yes, and all I want to
19 know is why one institution gets one reading and
20 why the other institution gets a different reading.

21 THE COMMISSIONER: I would just like
22 to assume, though, that it is one of those three,
23 that is all.

24 MR. OLAH: I believe it is, and
25 perhaps I can put in a hypothetical and come back --

THE COMMISSIONER: All right.



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MR. OLAH: -- some other day and
point to the transcript reference if you like,
Mr. Commissioner.

THE COMMISSIONER: All right.

MR. OLAH: I am being given
instructions by the television crew.

THE COMMISSIONER: What are you
doing wrong?

MR. OLAH: I am speaking too close
to the mike.

THE COMMISSIONER: You can't say
we don't learn something every day.

MR. TOBIAS: He will never make it
in show business.

MR. OLAH: I will have to take
acting lessons next, Mr. Commissioner.

Q. Mr. Cimbura, do you understand
my concern and can you perhaps assist me as to what
explanation if any, assuming that those are the same
blood, that is taken at the same time, is there
some explanation that you can offer us as to why
we are getting different readings on what appears
to be the same blood.

A. What is the reading?

MR. HUNT: May we also just point



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2 out so that my friend doesn't have to go over it,
3 Note 6 on page 4, Dr. Wong's test was run on
4 sample T41 which is also part of that two samples
5 my friend is referring to, and Mr. Cimbura has
6 already indicated his reading was 100 on his
7 analysis of that sample, so that maybe with respect
8 to this particular sample we have three readings
9 from three different sources.

10 MR. OLAH: Well that makes it
11 even more interesting.

12 MR. LAMEK: Well, there is one
13 other thing, with respect, Mr. Commissioner: it
14 is clear on the evidence that although we do not
15 know what RIA kit the TGH uses we do know the one
16 used at the Sick Children's Hospital is different
17 from the one used in the Centre for Forensic Science.

18 In order for my friend to expect
19 absolute identity of result he must surely posit
20 the same equipment, the same procedure, absolute
21 similarity or identity all the way through.

22 MR. OLAH: Well, that may be the
23 answer, and if Mr. Cimbura can give that answer I
24 would be grateful.

25 All I am seeking: we seem to have
in several cases like, Mr. Commissioner, you will



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recall that one result went to Mount Sinai Hospital
on Pacsai.

THE COMMISSIONER: Yes.

MR. OLAH: Resulted in 26 at Sick
Children's and resulted in something like 120 at
Mount Sinai.

What I want to explore is how certain
can we be with respect to RIA results when we are
getting those kinds of discrepancies? And certainly
I would assume that is a proper question.

THE COMMISSIONER: It is a proper
question. That last comment, though, is argument.
It is not a question at all.

MR. OLAH: I am just trying to point
the direction --

THE COMMISSIONER: All right.

MR. OLAH: -- so that my friends
appreciate where I am going.

THE COMMISSIONER: All right. If it
is one of the three on page 57 of Exhibit 116, and
if that is also represented by T40 and T41 in
Exhibit 95A there is a discrepancy.

MR. OLAH: If there is a concern
about it I can go to a sample which is identical
and show a discrepancy.



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3 THE COMMISSIONER: Yes. All right.

4 MR. OLAH: Perhaps I should do it
5 that way.

6 THE COMMISSIONER: I was just giving
7 you a preface. Now you ask the question, can you
8 account for the discrepancy? Isn't that the
9 question you want to ask?

10 MR. OLAH: That is the question I
11 was trying to ask and I am grateful for your
12 assistance.

13 Q. Do you understand the problem
14 or the concern I have, Mr. Cimbura?

15 A. I understand your concern. I
16 am not familiar with this document so I am not
17 sure what value you want me to compare.

18 Q. Well, in one case assuming
19 that we have got the same blood, we have got a
20 result of in excess of 100 nanograms. We don't
21 know how far. It could be 200, it could be 300, or
22 it could be 101.

23 Assuming that the blood was taken the
24 same time, your results would seem to indicate a
25 reading of 91 nanograms.

A. It so indicated.

Q. Which would indicate at least



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3 a 10% difference between the two readings. Can you
4 assist us as to why we would get that kind of a
5 difference?

6 A. Well, I think a difference
7 of 10% between our degrees would not be bad if it
8 was 10%. Some reasons that may be responsible for
9 that is the reason Mr. Lamek mentioned. Another
10 reason is that our method, as you know, uses
11 extraction where you expect to lose something so
12 it has a tendency to lower results to some degree.

13 Q. Let's go on to the case that
14 I posited to - or we have had in evidence already
15 here, where the Pacsai reading at the Hospital for
16 Sick Children was 26 nanograms, and the one that
17 was obtained at Mount Sinai using an RIA method
18 was somewhere in the order of about 112 as I recall.

19 THE COMMISSIONER: That is almost
20 impossible for him to answer. Those are two
21 entirely different institutions.

22 MR. OLAH: If I may be permitted --

23 THE COMMISSIONER: Yes, but that
24 he had no part of.

25 MR. OLAH: Q. Would that kind of a
range be surprising to you or is that kind of a
variation that is something to be expected?

A. If it was done by the same RIA



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3 it would be surprising and you would not expect it
4 by the same procedure.

5 Q. Would simply the difference
6 in kit, would that result in that kind of variation
7 in your experience?

8 A. I wouldn't think in that kind
9 of a variation, no.

10 Q. What kind of a variation should
11 we be expecting in your opinion, Mr. Cimbura,
12 assuming a different kit and perhaps an extraction
13 process being added to the RIA as opposed to an
14 RIA alone?

15 THE COMMISSIONER: We had a chart on
16 this somewhere at some point way back when, in
17 which somebody experimented with --

18 MR. OLAH: With the different anti-
19 bodies.

20 THE COMMISSIONER: Well I thought
21 it was somebody experimented with certain testing
22 done by various institutions under RIA and HPLC and
23 everything else. Did you produce that?

24 THE WITNESS: No, I haven't.

25 THE COMMISSIONER: I thought it was
early, very early.

MR. LAMEK: It may have been
Dr. Seccombe.

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THE COMMISSIONER: It might have been.

MR. OLAH: There was Exhibit 8 in which they got half the readings in one instance using a different antibody or using a different kit. That is the report --

THE COMMISSIONER: I won't take up everybody's time but I know that we have had that and it shows variations and it shows - it is a chart of some sort and it may have been in one of the reports. They had the various institutions throughout North America doing it.

Well, I would be wasting a lot of time looking for it now, but I know there is such a thing. It doesn't matter, so you go ahead with your questions. I know we did have that chart from somebody.

MR. OLAH: Q. Going back to something else that was explored with you this morning, Mr. Cimbura, you will recall when you were examined by Mr. Roland about the analysis of postmortem blood in heart tissue from children not on digoxin therapy (that is page 8 of Exhibit 213), in the 12 samples of children under two months that were tested there was no digoxin recorded by the RIA alone.



J14 1 Is that your evidence, sir?

2 A. Document 8, is it, Exhibit 8?

3 MR. LAMEK: Yes.

4 THE WITNESS: That is right, 24
5 children were analyzed.

6 MR. OLAH: Q. And 12 of those were
7 two months or less?

8 A. That is right. The results
9 of the RIA analyses gave a negative result.

10 Q. I assume you have read the
11 literature that has been filed as exhibits in these
12 proceedings and you are familiar with the various
13 reports such as the New England Journal Report, the
14 Waldous Report, the Brett Report and all of the
15 other findings in which simple or RIA alone in
16 babies, applied to baby's blood, found a digoxin-
17 like substance. In other words, recorded something
18 that wasn't digoxin because the children didn't
19 have digoxin given to them.

20 A. I am not sure whether I am
21 familiar with all of the reports you mentioned, but
22 I am familiar with this phenomenon, that is right..

23 Q. Well, that was the experience
24 of the Hospital for Sick Children you will recall.
25 Are you aware of that, that digoxin was found in



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children who were not supposed to have received digoxin. That was on another floor.

THE COMMISSIONER: On the 7th floor?

MR. OLAH: Q. On 7C and D. Were you aware of that, Mr. Cimbura?

A. I am not aware if I am or not because we have had so many phone calls throughout the years that I think I was aware to the extent that they thought at that time they had values where they shouldn't have had values, that is right.

Page 1863 follows....



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Q. You are aware of Dr. Seccombe's works and his evidence, are you, about the finding of digoxinlike substances?

A. Yes, I read his brief paper a long time ago, several months ago.

Q. I guess what I am curious about, sir, why is it that in all of these reports when an RIA technique is applied in situations where patients don't have digoxin, and they find a digoxinlike substance, when you apply your RIA to patients not on digoxin you don't find those kind of digoxinlike substances?

A. Well, as was mentioned before by negatives means a detection of less than 1. That may be a partial answer. Another answer may be that none of these investigators as far as I am aware have used an extraction prior to the RIA.

Q. Excuse me, sir, if you have a look at Note 1, it seems to indicate that the process of analysis was by radioimmunoassay method, does that mean it was HPLC in combination with RIA, or just RIA alone?

A. Well, RIA to which extraction was applied before RIA, that is the procedure described.

Q. I see. So you are saying that



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the extraction may have removed this digoxinlike substance?

A. I have no proof, but it may, that is right.

Q. And if it doesn't, then what other explanation could be given for the fact that approximately six other teams have found this substance when applying RIA, and some of them have found fairly high readings within the therapeutic levels; whereas you did not find that digoxinlike substance?

MR. HUNT: Let my friend in addition put to the doctor ---

MR. OLAH: I am sorry, he is not a doctor.

MR. HUNT: I am sorry, to Mr. Cimbura, and thank you for pointing that out, Mr. Olah. Let my friend put in addition the evidence of Dr. Seccombe with respect to the kit that he was using and his findings insofar as the kit and its reactivity with the substance was concerned, he left that out of his presentation.

MR. OLAH: Q. I think in all fairness, Mr. Cimbura, the kit, depending on the kit you used you find different values, and if that is the answer for why you didn't find this digoxinlike substance,



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fine. All I am interested in is why six teams seemed to have this experience and your team doesn't seem to have that same experience?

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A. I think I am giving you the possibilities.

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THE COMMISSIONER: Yes.

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MR. YOUNG: I hesitate to interrupt my friend, but my recollection of Dr. Seccombe's evidence was a little more than that. He said that the particular assay, the antibody used in this particular assay seemed to cross-react in a very different manner than any other antibody that he had come across. He went to great lengths and brought up all the antibodies he could find that would react in this way and he thought this was an unusual reaction, and indeed that would probably explain the distinction.

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Might I also point out while I am standing, Mr. Commissioner, I think the chart that we were discussing earlier is in Exhibit 25, on the last page there is a ---

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THE COMMISSIONER: 25?

MR. YOUNG: It is a chart that seems to compare RIA and TDX and results of various hospitals and institutions.

THE COMMISSIONER: That is the one I had in mind.



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MR. YOUNG: Is that the one?

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THE COMMISSIONER: Yes, I think so,

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thank you, Mr. Young.

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MR. OLAH: In all fairness, in

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response to Mr. Young, Mr. Commissioner, Exhibit 8 is

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a case in which two different antibodies were used

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and in both instances digoxinlike substances were

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found although in different quantities. So that

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simply to suggest that only in one RIA antibody do

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you get this kind of phenomena is not quite so.

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THE COMMISSIONER: Well, we are getting

into argument several months ahead of time.

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MR. OLAH: Yes, sir.

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THE COMMISSIONER: No, that is not the

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one I had in mind, Mr. Young, it is not 25, there is

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another and I will find it.

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MR. OLAH: May I then put my question

to the witness, Mr. Commissioner?

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THE COMMISSIONER: Yes.

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Q. Mr. Cimbura, can you then respond

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to that problem?

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A. I believe I have partially

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responded, there are differences between methods, our

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method employs an extraction which sort of purifies

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the blood before the RIA. Our method ---

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Q. May I stop you there, you are then suggesting that your extraction process takes out this Substance X or whatever it is?

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MR. HUNT: Would you please let the witness finish. You should not interrupt him and then say, that is what you mean to say.

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MR. OLAH: I was simply following up on one portion of the answer, Mr. Commissioner.

MR. HUNT: That is not what my friend was doing, Mr. Commissioner, he was stopping the witness part way through the answer and saying, there, that is the answer.

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MR. OLAH: Well, if that is not correct I am sure --

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THE COMMISSIONER: Try the question again then, Mr. Olah, and we will see what happens. I know it is a long question, but you know what the question is, we have had it now four or five times. Can you account for the differences in the results between your method and other people's methods, and we will try and let you go at least until 1 o'clock and then --

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MR. OLAH: With Mr. Hunt's help I am sure we could go longer.

THE COMMISSIONER: Could you try that



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one again now, start at the beginning.

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THE WITNESS: I understand the question is: why are we not seeing any Substance X as compared to some of the reports and the literature?

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MR. OLAH: That is precisely the question.

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THE WITNESS: As I said that possibilities, one of the possibilities is that we are using extraction which may remove Substance X. Another possibility is that as far as I am aware I have not seen the same antibody, the same manufactured kit that was used in the literature that was published, and here this is, to the best of my recollection, I may not have seen them all, but certainly the one by Dr. Seccombe did not include the same antibody that we had used.

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Another partial explanation may be that our detection limit is a little bit higher than was - I believe Dr. Seccombe wanted to see, apparently was as low as .2 or something like that, I don't recall.

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MR. OLAH: Q. Let's take those step by step. You are saying then that the extraction process is far - possibly takes out Substance X?

A. It may, I have no proof of that



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but it stands logically for a person in my field that is the reason why I extract or remove certain things that I don't want in the test.

Q. And that is the separation technique, is it, sir?

A. That is extraction technique; whereas blood is extracted with some solvent, organic solvent. So in effect you are transferring the digoxin from the blood, from the mixture, you know how blood looks red and so on, into the organic solvent which is much cleaner after that time.

Q. When you were carrying out this study were you aware of Substance X at that time?

A. I don't believe I was then but I was aware of the general limitations of IRA and the caution to purify blood before apply tests.

Q. So would it be fair to say that other than sort of the general attempt to purify the blood you were not specifically to exclude Substance X?

A. Well, I believe at that time there was no mention specifically of Substance X anywhere.

Q. And your detection level was from 1 nanogram up, was it not?

A. That is right, the detection



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level negative means that it is ---

Q. It is 1 nanogram or --

A. That it is less than 1 nanogram.

Q. Less than 1 nanogram?

A. If it is that, because you don't know, it is negative.

MR. OLAH: I am about to traverse to a different area, Mr. Commissioner.

THE COMMISSIONER: Yes, all right.

MR. OLAH: Thank you.

THE COMMISSIONER: For your benefit, Mr. Lamek, it doesn't look as though we will be able to take on anyone else. I would like to say that I am anxious to complete Mr. Cimbura today. So it is possible we may be sitting a bit late. If we do manage to get through before 4:30 I won't hold it against you that you don't have anybody standing by.

MR. LAMEK: All right, thank you.

THE COMMISSIONER: All right then, two-thirty.

--- Luncheon adjournment.

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AA/BB/ak

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2 ---Upon resuming at 2:30 p.m.

3 THE COMMISSIONER: Yes, Mr. Olah.

4 MR. OLAH: Thank you, Mr. Commissioner.

5 Q. Mr. Cimbura, I'd like to now
6 change the focus of our discussion to some other
7 matters that were of concern to me. I'd like to have
8 you turn if you could to Exhibit 95A, please. That
9 is your initial report, sir. In particular, if I
10 could ask you to turn just as a matter of example to
11 page 4, T7.

12 A. Yes, sir.

13 Q. As I understand it, the RIA
14 alone yielded a result of 242 nanograms of digoxin
15 and digoxin-like substances.

16 A. That is correct, sir.

17 Q. And then subsequently with
18 the more refined test.

19 A. You are referring to the left
20 ventricle of the heart.

21 Q. Yes, left ventricle.

22 A. Yes.

23 Q. When you combined the HPLC
24 and the RIA you got a pure reading or what appeared
25 to be a pure reading of digoxin at a 105 level?

A. That is correct, sir.



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3 Q. In other words, we can say
4 with some degree of certainty that there was
5 approximately 119 nanograms of digoxin-like
6 substance in the sample you tested. That is digoxin-
like substance as opposed to digoxin.

7 A. No, the total value for the
8 digoxin and digoxin-like was 242.

9 Q. Well, if I segregate out the
10 digoxin alone would I not be left with digoxin-like
substances?

11 A. Well, it appears to make sense
12 but I'm not sure whether one could make that
13 deduction because of the different reactivities of
14 whatever these digoxin-like substances are present
15 there.

16 Q. I am not so much concerned
17 about precise numbers. What I'm trying to get is
18 a rough estimate or a rough weighing of how much
19 digoxin-like substances there would have been in
20 that particular sample for a question I want to pose
21 to you after that. Would it be fair to say that it
was a fairly large amount of digoxin-like substance?

22 A. Yes, it was relatively high,
23 I would agree, yes.

24 Q. And the question I really
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2 wanted to get at was this. I don't know if you can
3 assist me in this regard but would the digoxin-like
4 substances come from the breakdown of digoxin?

5 A. That was my conclusion that
6 they were derived from digoxin.

7 Q. And that breakdown, as I
8 understand it, is a result of the tissue decaying
9 or digoxin being released from the tissue?

10 A. No. Actually, what I believe
11 is that the chemicals in the Klotz solution - the
12 Klotz solution consists of various chemicals and
13 a combination of these chemicals - well, either one
14 or a combination of these chemicals chemically
15 degradates digoxin to digoxin-like substances.

16 Q. All right. So, the mode is
17 different, or the mechanism. But the point I'm
18 trying to ascertain is this. Would it be fair to
19 conclude that at some prior time, some time prior to
20 the measurement that you obtained, the digoxin level
21 would have been substantially higher than the 105
22 nanograms recorded in your result?

23 A. There is a possibility that it
24 was higher, that's right. If the analyses was
25 carried out at some time prior to that time.

Q. And I guess there is no way



1
2 of quantifying how much higher that reading would
3 have been, say, at the time of death as opposed to
4 whenever you took this actual reading?

5 A. That was the conclusion I
6 reached after examining all the multiple factors
7 that complicate this issue.

8 Q. Can you assist us as to
9 whether it would be substantially higher or marginally
10 higher?

11 A. It would likely be higher.

12 Q. All right.

13 A. It could be substantially
14 higher but of course I don't know, I cannot give you
15 any figure.

16 Q. All right.

17 A. The only figure I could give,
18 and the figures where I have expressed as a minimum
19 concentration in the fresh heart in some of the
20 specimens.

21 Q. I'm sorry, where you expressed
22 it as a minimum?

23 A. Minimum concentrations of
24 digoxin in the fresh heart before fixing.

25 Q. I see.

A. In my opinion that was the



1
2 only estimation that I could reach from all these
3 figures.

4 Q. Well, would it be fair to say
5 that tissue in preservative over some period of time,
6 if it had been brought to you, hypothetically,
7 fresh, it would have been higher than the figures
8 we see listed here?

9 A. You mean if it was brought to
10 me in Klotz medium but relatively soon after it
11 was placed in it?

12 Q. Correct, correct.

13 A. Yes, I would expect the figures
14 to be higher, that's right.

15 Q. All right.

16 A. Depending of course just - it
17 would depend. If I received those specimens
18 immediately, for example, after they were placed into
19 the Klotz solution, then of course I could believe
20 that the concentrations in the heart tissue then
21 would be of a similar magnitude as they would be in
22 the fresh tissue because some time is needed for
23 the digoxin to diffuse into the tissue, into the
24 surrounding medium and also some time is required
25 for the chemical degradation of digoxin.

Q. From your reports or your



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2 studies I noticed that you experimented with respect
3 to the degradation of digoxin in preservative fluid.
4 Did you have any opportunity to measure what the
5 degradation is with respect to tissue or different
6 kinds of tissue in Klotz solution?

7 A. Yes, those were two documents
8 that were presented yesterday.

9 Q. All right. I would like to
10 now discuss another area with you and, in particular,
11 I'd like to refer you to Exhibit 95E. It is the
12 report September 25th at page 5. In particular,
13 I would like to refer you to Laura Woodcock.

14 A. Yes, sir.

15 Q. On tissue analysis with respect
16 to that child. At the time that you did these
17 tests, or thereafter, did you ascertain or make
18 any enquiries as to whether some of these children
19 did not receive digoxin during their life?

20 A. I believe I have, yes.

21 Q. And was Laura Woodcock one of
22 those children?

23 A. Well, based on my recollection
24 she did receive some digoxin some time before her
25 death.

Q. All right. And would this



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2 account for the traces of digoxin found in her
3 system or in the tissue that was analyzed? You
4 will see that T103 refers to a trace, very low
5 levels, in other words.

6 A. That's right.

7 Q. Of digoxin-like material.

8 A. Yes.

9 Q. Did you make enquiries with
10 respect to the children Lombardo, Belanger and
11 Hines to ascertain that at no time during their
12 life were they on digoxin?

13 A. This information was provided
14 to me, yes.

15 Q. What were your expectations
16 in running tissue sample studies, and I guess we
17 have to segregate Hines and Lombardo and Belanger
18 because they were different kinds of samples, but
19 dealing with Belanger and Lombardo, what kind of
20 expectations did you have in terms of digoxin results?

21 A. A forensic toxicologist
22 doesn't have any expectations.

23 Q. All right.

24 A. It is an unknown situation
25 and you analyze it and report what you find.

Q. All right. Once you received



1
2 those reports with digoxin, certainly with respect
3 to the Lombardo child, being found in some of the
4 exhumed tissue, were you surprised?

5 A. It was a finding which was
6 contrary to the history available about the child,
7 that's right.

8 Q. All right. In other words,
9 in retrospect, would you have expected to find
10 either a trace or no trace of digoxin in those
tissues?

11 A. Well, if the child Lombardo
12 was not given digoxin I would expect to find nothing,
13 no digoxin in these tissues.

14 Q. Now, I want to be clear with
15 respect to those two children. They were exhumed
tissues?

16 A. Right.

17 Q. And is it the combination of
18 the RIA and the mass spec. that gives you some
19 confidence if any in the results from those tissues?

20 A. Well, the confidence that
21 one obtains in my field of work is from experience,
22 long experience dealing with examination of drugs
23 in body specimens and of course the results of the
24 tests that one obtains. The confidence that I have,
25



1
2 that I have reported, constitutes a conclusion made
3 at the end of all of the analyses that were made.

4 Q. Fair enough. Now, as I
5 understand your conclusions your major conclusion is
6 that you cannot really help us in terms of the
7 actual levels in the tissues of those two children?

8 A. Which children?

9 Q. We are talking about Lombardo
10 and Belanger, the exhumed tissues.

11 A. Well, I think they have to
12 be separated for consideration. Generally speaking,
13 essentially at the later stages of the investigation,
14 the results in tissues of exhumed children I
15 considered inconclusive with respect to digoxin
16 toxicity.

17 Q. All right.

18 A. The Lombardo child, while he
19 falls into this category, had substantial amounts
20 of digoxin. That is I think the best I can say.
21 The amounts found in his tissues were higher than
22 all the other exhumation cases.
23
24
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Q. Yes.

3

A. The results are still by

4

themselves inconclusive and with respect to digoxin
toxicity, however.

5

Q. I would like to turn you to

6

the note on page 4 of that particular report which

7

reports on the child Belanger, Note 3, and I take

8

it that ---

9

A. Which page is that, sir?

10

Q. Page 4, Note 3, about a third

11

of the way down the page.

12

A. Page 4, Note 3?

13

Q. Yes.

14

A. And that is the note - I will

just refresh my memory.

15

Q. Please take a moment.

16

A. That is the note with respect

17

to child Belanger, is that right? Yes, sir.

18

Q. I guess what you are saying

19

there is that the extent of the digoxin concentration

20

cannot be ascertained with a degree of scientific

21

certainty, but my question is certainly you have

22

no doubt that digoxin was found in those samples?

23

That can be ascertained with a reasonable degree of

scientific certainty?

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A. My conclusion refers to
quantitative interpretations; you said based on
numbers.

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Q. Right. But you have no doubt
today as to the fact there is a reasonable scientific
certainty, you can say that to the Commissioner, that
in fact digoxin was found in those tissues?

8
9
10
A. That is correct, sir, within
what I call a reasonable scientific certainty I
believe that we found digoxin in these tissues.

11
12
Q. That is the distinction I
wanted to clarify.

13
14
I take it you make the same observation
with respect to the Lobardo child?

15
16
A. A similar observation with
the qualification, as I said previously, that in
child Lombardo the amounts found were substantial.

17
Q. Yes.

18
19
20
A. I still cannot conclude from
that alone on digoxin toxicity, but the fact remains
that they were substantially higher than all the
other exhumations - child's exhumed.

21
Q. All right.

22
23
I would like to go back to the child
we started our discussion with, that is the child

24

25



1
2 Inwood. I notice in Exhibit 95A - that is the
3 first report - at page 8 you conclude that ---

4 A. I am sorry, oh, yes, page
5 8, is it? Yes.

6 Q. - that an estimate of the
7 concentration of digoxin in the heart before it was
8 fixed in the Klotz solution was not less than 549
nanograms per gram?

9 A. That is correct, sir.

10 Q. And do I take that to be in
11 the toxic range as well as the therapeutic range?

12 A. That is right, it is in both
ranges.

13 Q. All right. Now you remember
14 that you and I talked about the serum when we first
15 started our discussion, and that was a very, very
16 high reading in the toxic range? Correct?

17 A. In serum from?

18 Q. In serum.

19 A. From the same child?

20 Q. The same child.

21 A. Yes. A value you are referring
22 to is 491 that was found?

23 Q. That is correct.

24 A. That is right. It was above
25



1
2 the fatal range.

3 Q. All right. Now you remember
4 Miss Kitley saying to you that where you have got
5 a tissue sample falling into ranges, it is difficult
6 to ascertain whether it is in a therapeutic range or
7 the toxic range. Do you remember that? Do you
8 remember that discussion?

4
9 The discussion I have is bearing in
10 mind the serum reading in this case which was very
11 high, does that assist you in determining whether
12 in fact this child was administered toxic doses of
13 digoxin, or can you assist us in that regard?

14 A. To go back first to the
15 finding under my Item No. T8 from the child Inwood,
16 which is the examination of the heart tissue in
17 the Klotz medium, and I have estimated from that that
18 the concentration in the fresh heart was not less
19 than 549 nanograms per gram. As you said this falls
20 into both of the ranges. That is why by itself this
21 would be inconclusive.

22 Q. But coupling the two
23 observations ---

24 A. If I can assume that the
25 serum is a true specimen of serum then the finding
of 491 in the specimen of serum is consistent with



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death due to digoxin.

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Q. Can you take the next step then or the further step to say that in fact this child was the subject of toxic levels of digoxin? Can you say that with some degree of scientific certitude?

A. Would you repeat that, please.

Q. Can you go one step further and can you tell this Commission whether or not with some degree of scientific certainty that this child was administered or was the subject of toxic levels of digoxin?

A. Well, my function as a forensic toxicologist is to assist the medical personnel, pathologists and so on, by telling them that a finding, a certain finding is consistent with death due to poisoning, meaning it could account for it.

Q. Well, I am not asking for cause of death.

A. All right.

Q. I am asking for whether this child received from the material you have toxic levels of digoxin?

A. Well, assuming it is a true



Cimbura, cr.ex.
(Olah)

1885

specimen of serum I would expect certainly toxicity from that, yes.

Q. Thank you.

Nqw a couple of other questions: in the case of Exhibit 95C, page 2, in particular Samples T60 at the bottom of page 2 and Sample T61. Those are samples of the Lombardo child, and there is presence of digoxin in the stomach and the contents of the small bowel.

A. I am sorry, I lost the number of that page.

Q. I am sorry. You are having problems because of the dates. I am not giving you the dates.

This is the report of March 25th, 1982. Okay? And I am asking you to consider the very bottom analysis on page 2 and the very top on page 3.

A. Yes, I have it now, thank you.

Q. All right. You will recall that this relates to the Lombardo child who as we believe did not receive any therapeutic doses of digoxin.

I wanted to ascertain from you,



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1
2 and I don't know if you can help us - this may be
3 in the field of a pharmacologist - is whether the
4 presence of digoxin in the stomach and the small
5 bowel is indicative of the mode in which the digoxin
6 got there; whether it is secreted or whether it is
7 an oral injection, and I don't know whether that is
8 beyond your scope of expertise. If it is, please
9 don't hesitate to tell me that.

10 A. My answer in any case would
11 be I don't know.

12 MR. OLAH: All right. Mr. Cimbura,
13 thank you. Those are all the questions I have.

14 THE COMMISSIONER: I am just wondering,
15 Miss Kitley and Miss Jackman, have you satisfied
16 yourselves or dissatisfied yourselves, whatever?

17 MS. KITELY: I think perhaps dis-
18 satisfied is the proper word for it. It appears that
19 what I was trying to do cannot be done, but what I
20 would like to do is put a couple of questions to
21 reflect how the problem arose.

22 THE COMMISSIONER: Yes. All right.

23 FURTHER CROSS-EXAMINATION BY MS. KITELY:

24 Q. Mr. Cimbura, if you will keep
25 a copy of Exhibit 95 in front of you?

When Mr. Lamek went through the



1
2 questions with you the other day you were careful
3 to point out by way of an example - let's look at
4 page 2, Item T11A, that where the words were used ---

5 A. That is page 2 of the ---
6 THE COMMISSIONER: Of the first
7 report.

8 THE WITNESS: Page 2 of the first
9 report, is it?

10 THE COMMISSIONER: January 11.

11 THE WITNESS: Sorry. Okay, thank you.

12 MS. KITELY: Q. Where the words are
13 used, and I am quoting, "The tissue was found to
14 contain 36 nanograms per gram calculated as digoxin
15 of a mixture of digoxin and digoxinlike substances".
16 That was from an RIA test? Right?

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A. What this terminology indicates
is two methodologies were used here.

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Q. Right. What I have just read
is IRA?

5

6

A. What you read is IRA and the --

7

Q. And the next sentence, and I
quote:

8

9

"The concentration of digoxin was
8 nanograms per gram ... ",

10

that is HPLC?

11

A. That is correct.

12

13

Q. Now, would you go to page 4 in
the note; and let's look at Note 3 where the words
are used:

14

15

"The concentration of digoxin ... ",
you will agree with me that those words are consistent
with what I have just read on page 2, which indicated
on page 2 an HPLC result?

16

17

18

A. I have brackets after that (T42),
is it Note 3 that you are wondering about?

19

20

Q. Yes.

21

A. It says:

22

"The concentration of digoxin in the
heart muscle (T42) ... ".

23

Q. Yes.

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A. Would you look up my identity T42?

Q. Yes. T42 is a fresh specimen.

A. That is right.

Q. Can we do it my way for a second, Mr. Cimbura. Would you agree that the words that are used in Note 3, and I quote: "The concentration of digoxin ...", are the same words that Mr. Lamek was careful to point out on page 2 were indicative of an HPLC test.

A. I am just getting a little bit tired, would you repeat that again, please?

THE COMMISSIONER: "The concentration of digoxin in the heart muscle ...", did you refer to that, oh, " .. concentration of digoxin ... ", yes, all right.

MS. KITLEY: I will approach it a different way, Mr. Commissioner.

THE COMMISSIONER: Well, approach it that way if I understood it.

MS. KITLEY: Q. Am I correct, Mr. Cimbura, that we have no ranges for HPLC?

A. Ranges in what?

Q. Ranges for blood, heart, lung or liver?

THE COMMISSIONER: Well, we have no



CC.3

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ranges with figures that result from the HPLC, is that
what you mean?

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MS. KITLEY: Yes.

5

THE COMMISSIONER: The ranges are the
ranges of digoxin and ---

6

7

MS. KITLEY: Q Well, you have
established that there are therapeutic ranges and fatal
ranges, right, Mr. Cimbura?

8

9

A. In fresh autopsy specimens.

10

11

Q Well, take it from there; we have
no information before us as to therapeutic and fatal
ranges where the sample was tested on HPLC?

12

13

A. On which specimens?

14

Q Any specimens?

15

A. Well, for example if you combine
my findings in these children you will have a range
of HPLC values.

16

17

Q But aside from using those, because
you can't use those to establish the range because
they are the children the Commission is interested in.

19

20

A. Okay.

21

Q Aside from the children in
Exhibit 95, there is no range of results using the
HPLC; there is no therapeutic range, and there is no
fatal range.

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A. That may be true, because it is based on literature and no one really at that time I don't believe used HPLC yet, they are beginning to use it now.

Q. So wherever in your report you used the words I have referred to as an example on page 2:

"Concentration of digoxin was ... ", that being an HPLC reading, there is no range to stick that in, to compare it with?

A. In the controls that we studied in fixed specimens HPLC was not used, so there is no HPLC in the controls that we studied in fixed specimens, that's right.

Q. And I understood you to say this morning when I was asking you about ranges, that you said the ranges on page 4 were at that time, and that in fact there are different ranges today?

A. Depending what tissue is involved there may have been - there were some additional reports which would change the range of course; and there were additional findings in my research which would change the range, that's right.

Q. I think in our discussion at lunch time your concern was that if you had to find



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1983 ranges it would require you to do an exhaustive study of the literature?

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A. It would require that, yes.

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MS. KITELY: Those are all the questions I have. Thank you. Might I say I would like to thank Mr. Hunt for making Mr. Cimbura available over the lunch hour.

7

8

9

THE COMMISSIONER: Yes. It is not all abuse, on occasion you get a kind word.

10

Miss Jackman, do you have any questions?

11

CROSS-EXAMINATION BY MS. JACKMAN:

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14

15

Q I want to clarify what, exactly what the levels mean in terms of the levels that you found, or if they mean anything. You have already said there was a problem with tissues, but there was blood and there is some certainty if it is post mortem.

16

17

A. I am sorry, I didn't quite hear you, would you repeat it, I am not hearing it?

18

19

20

21

Q One of the things that I believe you were suggesting yesterday you would say you would be more certain of the level meaning something if it was a blood post mortem than if it was a tissue post mortem?

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A. Yes, that is correct.

Q Or the significance of it?



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A. Yes.

Q. In terms of Exhibit 95 you have put the levels within ranges, toxic and fatal ranges, some of them?

A. I tried to put it whenever I could, that's right.

Q. Now what I would like to know, Mr. Cimbura, is how much information you had about the child? Exhibit 212 seems to indicate that you got a one-page note from the Hospital on the different samples, were you given the children's charts?

A. Are you referring to the control children?

Q. No, not the control children, I am talking about the children that are the subject of this hearing?

A. The children under investigation?

Q. Yes.

A. At some stage or other, yes. For example I have now a detailed summary of all clinical history and all clinical findings and so on. I am not sure, it was probably at a later stage.

Q. After you had done the tests?

A. Pardon me?

Q. After you had done the tests?



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A. After I had done at least some tests, yes. You see, our tests were continued as you know until when - until, the last report was December last year, so I am not exactly sure when I received all the information that I have now. But at the beginning I would not have received that, I would receive from the police usually much less information, less then I usually want.

Q. The information that you did get, the detailed summaries of the children, the children's condition, would that have been in 1982 that you were given that, or in 1983, can you estimate around when?

Perhaps I can put it this way. Did you receive it do you believe before you did your first report for Sergeant Warr and Dr. Tepperman on January the 11th, or for Mr. McGee, I should say.

A. I am not really, I may not have had a complete history yet then but I had quite a lot of history. You know, because we talked about, there were many meetings and discussions and many of those aspects were being continuously discussed.

Q. So what kinds of information would you have from them in terms of doing the testing around the child's history?

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A. I may have had any kind of information that was available at one stage or another.

Q. What I am trying to get at, were you told if the child had renal failure?

A. Well, that was a question I specifically asked myself you know, yes.

Q. Were you told if the child had a congestive heart, congenital heart disease or congenital heart failure?

A. I may have known that information, yes.

Q. You think you may have but you are not certain when?

A. That is right.

Q. Mr. Cimbura, when you are looking at the levels that you have come, arrived at through the testing, would it be safe to say that each level, the significance of each level depends on the child itself, the child's condition?

A. I don't think I can answer that, what sort of significance are you talking about?

Q. Well, for instance, if you had a child with high blood level, a high digoxin level in the blood post mortem, and you were to find out subsequently that that child had had severe renal



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failure, then that level would mean something different to you in light of the fact the child had renal failure than if the child didn't have renal failure?

A. Yes, basically.

Q. So that with these levels when you are putting them within the ranges they may not actually - if some level for instance is within the fatal range because of perhaps renal failure or something like that, it could in fact not mean that it was consistent with a fatal dose such that it might be the cause of death?

A. Well, it would - for example if there was a renal problem of course it would be a problem to determine to what degree that could attribute the totality of the findings. So a level that falls into the, that falls clearly into the fatal range for blood is consistent with or could account for death, could, I mean that is a possibility, other factors to be investigated.

Q. And if the other factors were investigated it could account for it, but the other factors could take it out of that fatal?

A. It may or may not depending on many things, yes.

Q. Depending on the factors?



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A. Depending on the extent of renal failure and the degree of the level and many other considerations, yes.

Q. Now, when you were suggesting the ranges in Exhibit 95 in your report, and you were stating the particular findings as being within a therapeutic or a fatal range, you were not adjusting that in light of the child's clinical condition, were you, when you did that?

A. No, I don't believe so, no.

Q. Would it also be fair to say that contamination could in fact also affect the significance of a finding?

A. If you could prove it, certainly.

Q. So that a finding that could be in a fatal range, if you could show that it was contaminated may not mean anything at all?

A. Obviously contamination is something abnormal.

Q. Mr. Cimbura, these findings and the statements that they are within a therapeutic or fatal range do not reflect any adjustment for contamination or anything like that as well, is that correct to say?

A. They do not reflect any adjustment for contamination?



CC.11

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Q. That was not something, that was something you assumed they were not.

4

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A. If I knew a sample was contaminated I would not have included - I would have mentioned that in regard to my finding.

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7

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Q. If you didn't know the sample was contaminated or not would you check it out, find out if it was, or would you just assume it wasn't?

9

10

A. It is not easy, there is no way I could check it.

11

12

Q. So you would assume it was not contaminated unless you were told that it was?

13

14

A. Unless there was some proof that it was, that is right; some proof or some suggestion, or some theory; or some history; or something.

15

16

17

Q. Now the research studies, the control studies that you have done in Exhibit 213, when did you begin doing those studies, approximately?

18

19

A. Yes, which is that again, I am sorry?

20

21

Q. Exhibit 213.

A. Are you referring to this bundle?

22

23

Q. Yes, I want to know when these were started and when they were finished?

24

25

A. Well, some of them were started



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as early as April/May 1981, or around that time
anyway.

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Q. And when did you complete

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them?

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A. Some of them were - well, I recall some still in late 1982.

Q. The samples that you used for the studies, were they all provided to you from the Hospital for Sick Children?

A. Yes.

Q. So, these are infants who died at the Hospital?

A. That's right.

Q. That's right.

A. I am making a general ---

THE COMMISSIONER: You are guessing that that is so?

THE WITNESS: Pardon me?

THE COMMISSIONER: You are guessing that, are you?

THE WITNESS: Yes, I will have to examine it.

THE COMMISSIONER: I think we have heard evidence that ---

THE WITNESS: I believe my recollection is that, sir ---

THE COMMISSIONER: --- a great many autopsies takes place at the Hospital for Sick Children for children who died elsewhere?



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THE WITNESS: As far as I can recall it, at least the majority of them came from the Hospital for Sick Children, and perhaps all, yes.

MS. JACKMAN: Q. Now, Mr. Cimbura, I note in some of the studies that you have done there is a notation, for example, on page 17 of Exhibit 213.

A. Yes.

Q. Note No. 3 is the deaths were due to causes other than digoxin poisoning. How were you aware of that?

A. Well, I would be aware of any death there by my function, that was due to the digoxin poisoning.

Q. No, but would the Hospital tell you that the children, that their cause of death had been decided to be something other than digoxin?

A. I would be told by the chief coroner if there was such a thing and I have discussed with the chief coroner for the Province.

Q. And would that be true as well with the children that you studied that are the subject of this investigation?

THE COMMISSIONER: Would what be true?



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MS. JACKMAN: That he was aware that there were other causes of death aside from digoxin poisoning.

THE COMMISSIONER: If he knows the answer to that perhaps we can close the shop and go home.

MS. JACKMAN: No, Mr. Commissioner, I'm not saying that that was the cause of death, but a number of the children, their final autopsy reports, or the discharge summaries give different causes of death other than digoxin poisoning.

THE COMMISSIONER: Oh, yes, I see.

MS. JACKMAN: I am just asking him if he was aware of those different causes of death for these children that are the subject of this investigation.

THE WITNESS: As I have examined the medical charts of all of these children as part of my research, so, I was aware of these things, yes.

MS. JACKMAN: Q. Okay.

A. If I may qualify myself, medical charts of many of these children. On some of them I didn't need to go to the medical charts because information was provided to me by the



D4
1
2 pathologist.

3 Q. Now, on Exhibit 213 on Graph 11
4 or page 11, sorry, this was a control study, I under-
5 stand. Is it possible that the same up and down
6 curve could occur in the tissues of a child who has
7 died?

8 A. By up and down you mean the
9 little blip there further down?

10 Q. Where it goes up at 50 days,
11 between 40 and 50 days.

12 A. There is that possibility,
13 I couldn't rule it out, that's right.

14 Q. It is a possibility. Is it
15 also possible at least theoretically that it could
16 be over a shorter period of time, or you wouldn't
17 know?

18 A. That I can't answer because I
19 don't know. In this study the increase is around
20 40 to 45 days.

21 Q. Yes.

22 A. 'And I haven't seen it anywhere
23 else.

24 Q. But you couldn't exclude it
25 not knowing if in fact it could be a shorter period
of time?



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A. Well, I could exclude it if an experiment was carried out under identical conditions as this was carried out.

Q. But an experiment like that wasn't carried out.

A. Well, it was.

Q. No, I mean in the child?

A. Oh, in a child.

Q. I'm talking about in the tissues of a child.

A. No, you would have to analyze the samples over many days.

Q. Now, going back to Exhibit 95 on page 2, sample T27.

A. Yes.

Q. For Justin Cook is shown to be J05490 and you found that it contained 46 nanograms per millilitre of digoxin. Now, if you look at Justin Cook's chart, which is Exhibit 116 on page 57.

A. I don't have that to look at.

Q. I can just show you mine.

A. Oh, okay.

Q. On page 57 there is the same number J05490, which is the second column from the outside.



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A. J05490?

3

Q. Yes.

4

A. That's right.

5

Q. And it shows a level to be

6

68 nanograms?

7

A. That's right.

8

Q. Mr. Cimbura, can you account

9

for the discrepancy in this case because it would
seem there is a 22 nanogram difference and if you

10

compare that with the 46 nanograms that were found

11

in your testing that would be almost 50 per cent

12

discrepancy between the two samples.

13

A. 68 to 46?

14

Q. Yes.

15

A. I don't have my calculator

16

here. I think 50 per cent - if it was 50 per cent
it would be...

17

Q. I was putting the 22 on the

18

46 not on the 68.

19

A. Yes.

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Q. Between one-third anyways,

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almost, one-third to a half discrepancy depending on

22

which figure you are using. Have you any idea why

23

that discrepancy should be there. Perhaps I should

24

put it to you, does it surprise you that the

25



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2 discrepancy is that large?

3 A. Well, this is a little bit
4 higher. Assuming it is the same sample, which the
5 number J, I don't know what it means, this is just
6 one of the labelling and I don't know, you know,
7 how valid one can compare them.

8 Q. Well, assuming that it is
9 the same sample because it is the same number.

10 A. Assuming it is the same sample
11 the only conclusion I can reach is that our results
12 is lower and part of the, some of the reasons that
13 may account for it is the reasons I have explained
14 before that we extract and we lose some. We use
15 a different antibody and that's part of the reasons
16 for that.

17 Q. Now, I believe there is also
18 another discrepancy like that on page 5 of Exhibit
19 95A, which is T29 on the bottom of page 5, you found
20 a level of 69 and in the chart for Allana Miller,
21 which is Exhibit 115, the same appears.

22 THE COMMISSIONER: What page is that?

23 MS. JACKMAN: Oh, page 70, Exhibit
24 115.

25 THE COMMISSIONER: Yes, all right.

THE WITNESS: Yes. I notice in my



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report I have a question mark after the number meaning that I couldn't read it very well, but it appears to be the same, that's right.

THE COMMISSIONER: I'm sorry, you are comparing this with what page?

MS. JACKMAN: Exhibit 115, page 70.

THE COMMISSIONER: What's the figure there?

MS. JACKMAN: Is 78.

THE COMMISSIONER: 78 and 69?

MS. JACKMAN: And 69 was the finding by Mr. Cimbura's team.

Q. Mr. Cimbura, in light of those kinds of discrepancies, does that make more questionable the accuracy of the findings either for the Hospital or for the Centre?

A. Well, the last two findings are very comparable.

THE COMMISSIONER: I'm sorry, I'm sorry.

MS. JACKMAN: The 69 and the 78.

THE COMMISSIONER: I'm sorry, the specimen number, have you got that?

MS. JACKMAN: It is at the bottom of page 5, Mr. Commissioner.



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THE COMMISSIONER: I saw it but the number doesn't seem to be the same. Oh, you are quite right, I'm sorry, yes, you are quite right.

MS. JACKMAN: Q. Are there anything such as ranges in terms of how far you can go in having different readings on the same sample?

A. Well, obviously that would depend on the type of the sample, the level, the condition of the tissue, many factors.

Q. But if I am reading for instance the 69, should I be saying, well, that should be 69 minus 12 or plus 12, it could be either if I'm going to be accurate about it?

A. Well, I would think that the difference between two laboratories, between - what was it that they got?

Q. 78 and 69.

A. 78 and 69 would be quite comparable; certainly comparable within toxicological intent.

Q. Okay. I just had one further question and it is from something you said the last time you were here. You had stated that there was a possibility that your recovery studies might be published and you have given us the recovery studies



1
2 that you did. Have they been published yet?

3 A. No. I am planning to, they
4 have been accepted for presentation at the American
5 Academy of Forensic Sciences which is next February.

6 Q. Next February. Thank you.

7 THE COMMISSIONER: Thank you.

8 Mr. Labow?

9 CROSS-EXAMINATION BY MR. LABOW:

10 Q. Mr. Cimbura, with reference
11 to Exhibit 95C, that is your report of March 25th,
Sample No. T46.

12 A. What page on that report, sir?

13 Q. First page.

14 A. Yes.

15 Q. Sample No. T46.

16 A. Yes, sir.

17 Q. Was it ever indicated to you
18 that that sample was contaminated in any way?

19 A. Well, as I indicated, what
20 was indicated to me was that it was heated for a
certain time under a certain temperature.

21 Q. And my understanding is that
22 you told Mr. Lamek that you then simulated an
23 experiment with serum and heated it and found that
24 there was no significant change in the digoxin
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reading before or after the heating?

A. That is correct, sir.

Q. Now, other than that, was there any indication to you that this was contaminated?

A. No.

Q. Now, I'd like you to look at Exhibit 213. It is the sixth page entitled "RIA Intraassay Precision Heart Tissue".

A. Which page again, sir?

Q. 6.

A. 6. Yes, sir.

Q. Now, there were only two children studied in this test.

A. That is correct, sir.

Q. Do you know when the second child, that is No. 3, received his or her last dose of digoxin?

A. I may have that information but I don't have it with me, sir.

Q. If you could find it and tell your counsel I would be very interested to know.

A. All right.

Q. Now, before your results are looked at by someone trying to determine the cause of death, do we have to know in many of the



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instances when the last dose of digoxin was received
for these children?

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A. Are you referring to these

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control experiments?

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Q. Yes.

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A. Yes, and it is indicated on

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other documents from them.

9

Q. Right.

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A. You have that available.

10

Q. In some of the other documents

11

it indicates that there was the interval between

12

last dose and death was a certain time period?

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A. That's right, yes. The

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reason it wasn't included here was because for the

15

purpose of the study the interval was not for

16

the specific purpose.

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Q. You were only trying to

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find the lower range and the upper range in that
study?

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A. That was one concern, and to

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find the intraassay variation, that's right.

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MR. LABOW: I don't have any other questions.

THE COMMISSIONER: All right.

Mr. Tobias?

CROSS-EXAMINATION BY MR. TOBIAS:

Q. Yes, Mr. Cimbura, my name is Warren Tobias. I act for the family of Jordan Hines.

I believe you told my friend Mr. Olah that with respect to children who were not on digoxin therapy at all and had not been administered digoxin you would have expected in doing your assays to find no digoxin at all.

Is that correct? Did I understand the response you gave?

A. That is right.

Q. Now, I would like to ask the same question but in a much more specific set of assumptions.

I would like you to assume that you were given a sample of heart tissue that was taken at autopsy and preserved for a three-month period in Klotz fixative solution.

The other fact that I would like you to assume is that given that sample, you were



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also given the information that that child had not at any time during life had digoxin in any manner whatsoever introduced into its system and that you were to take that as the given fact. That was something that you knew.

THE COMMISSIONER: Mr. Tobias, you mean he had not had it prescribed?

MR. TOBIAS: No, I'm going further than that.

THE COMMISSIONER: All right.

MR. TOBIAS: He is to take as a fact that no digoxin had been introduced into the child's system during life.

THE COMMISSIONER: All right.

MR. TOBIAS: Q. Now, in doing your RIA, HPLC assays on that particular sample, would you also agree that you would expect in those set of circumstances to find no digoxin?

A. If that was from a child who was not supposed to be administered --

Q. Yes.

A. The only difference is the heart is placed into Klotz medium?

Q. That is right.

A. And stored there for two



EE3

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to three months?

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Q. That is right.

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A. That is right, I would expect to find no digoxin.

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Q. Now if in that same set of circumstances you did find digoxin on the assay and the level I am going to suggest to you is a level of, let's say, 250 nanograms, would you then draw the conclusion that at some time digoxin had been introduced into that child's system?

11

A. Assuming that was not placed into that Klotz solution after death.

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Q. All right.

14

Let me give you the other assumption. Assume that it was placed into Klotz solution.

15

A. It was not placed?

16

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Q. No, no, I am asking you to assume that it was placed in Klotz solution.

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THE COMMISSIONER: Are you talking about the heart, digoxin in the heart tissue?

19

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MR. TOBIAS: I am saying the heart tissue.

21

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THE COMMISSIONER: Are you talking about heart tissue or are you talking about digoxin?

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MR. TOBIAS: Oh, I see your point,

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EE4

Mr. Commissioner.

Q. Assuming that no digoxin had been put into the Klotz solution after death, and assuming that no digoxin had been introduced into the child's system during life, and assuming that you had the same sample that had been preserved in Klotz fixative three months, and you did find digoxin under assays, would it then be your conclusion that somehow digoxin had been introduced into that child's system before death?

A. May I repeat --

Q. Yes.

A. -- just to see what I think is correct?

Q. Yes.

A. If I find digoxin in a heart, fresh heart specimen, that has been stored in Klotz fixative for a period of three months; is that it?

Q. Yes.

A. And if I can assume that no one put that digoxin into the Klotz solution --

Q. Yes.

A. -- in the period between death and analyses; is that right?



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Q. Yes.

A. Then the child -- I believe that the child received digoxin before death, that is right.

Q. All right. Thank you.

Now with respect specifically to your result interpretation on Jordan Hines, I believe in your report you said that it was your conclusion that the fresh heart tissue would have had no less than 250 nanograms per gram of digoxin before it was fixed into Klotz solution?

That was your conclusion, was it not, doctor - or Mr. Cimbura, wasn't it?

A. I believe it was. Maybe I should look it up. What page was it, sir?

Q. I believe it was page 6 of Exhibit 95A. That was your January report. Or if not on page 6 then on page 7.

A. Yes, on page 7, that is right. I have it now, yes.

Q. Before you drew that conclusion, as I understand it, the specimen that you had consisted of heart tissue of Jordan Hines which had been taken at autopsy from the right atrium, the left ventricle and the septum; is that correct?



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A. The heart organ was, as I understand it, placed into the Klotz after the autopsy.

Q. Yes.

A. And when I received it I arranged to dissect it into the regions.

Q. I see. So that what you are saying is that at autopsy itself the heart was placed in Klotz solution?

A. Yes.

Q. Then you arranged to have it dissected and you took samples from the left ventricle, the right atrium and the septum; is that correct?

A. Essentially, other than saying I am not sure whether it was completely intact, fairly intact. There may have been a small piece taken out of that heart for other studies at the Hospital at the time.

Q. I understand. But in any event the tissue samples that you ran the assays on were from the left ventricle, the right atrium and the septum. Do I have that correct?

A. That is right, sir.

Q. All right.



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Now do I take it with respect to the right atrium you did not do both RIA and HPLC?

A. That is correct.

Q. But with respect to the left ventricle and the septum, on those samples you did both the RIA and the HPLC techniques; is that not correct?

A. That is correct, sir.

Q. All right. And that is why you were able to come to the conclusion that with respect to the left ventricle the concentration of digoxin was 52 and with respect to the septum the concentration was 89?

A. That is correct, sir.

Q. All right. Fine.

Now with respect to results on the heart of Jordan Hines, and those are the assays that you have just talked about, those that were not on exhumed tissues, am I correct?

A. No, this was tissue, as I understand it, placed in the Klotz medium, Klotz solution.

Q. Okay. Now I understand there were further assays done later on liver tissue that was from exhumation; is that correct?



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A. I believe so. Can I find it out in my report?

Q. Please look at Exhibit 95C, Mr. Cimbura.

A. It is the report from February 2nd, is that right, I believe? No, I'm sorry, I still don't have it. I will find it.

MR. OLAH: It is T44 in Exhibit 95A, Mr. Commissioner.

MR. ROLAND: And it is repeated in 95B.

THE COMMISSIONER: T44?

MR. OLAH: Yes, sir. You will see it is labelled liver, reported to be from autopsy after exhumation.

THE COMMISSIONER: All right.

MR. TOBIAS: Yes. That is correct.

Q. That report, Mr. Cimbura, dated February 2, 1982.

A. Well, the first part of that finding is on the first report that we discussed. I think I will have to go back to the original report we discussed with respect to Baby Hines.

Q. All right. Specimen T44



EE9

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2 on page 7 of the first report --

3 A. That is correct.

4 Q. Now assays were run on
5 liver tissues which were from exhumation.

6 A. Which were...?

7 Q. Which were taken after the
8 body was exhumed.

9 A. That is correct, sir.

10 Q. I understand you already
11 indicated yesterday to Mr. Lamek that you have some
12 concern with respect to interpreting your readings
13 when you are dealing with tissue which was fixed in
14 Klotz solution.

15 I also understood that you indicated
16 to Mr. Lamek that you have still more concern with
17 respect to interpreting readings that you found when
18 it comes to exhumed tissue.

19 So I am not going to ask you to
20 interpret it for me. I am only going to ask you this:
21 On the basis of the assays that you ran on the liver
22 tissue that was taken after the body was exhumed, are
23 you reasonably confident with some degree of scientific
24 certainty that what you found was digoxin without
25 commenting at all about the levels or what they mean?

A. Yes.



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Q. Okay. You are?

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A. Yes.

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Q. And your conclusion would be that it was digoxin that you found on those tissues. Correct?

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A. That is what my report states.

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Q. All right. Now this morning you were asked by Mr. Roland whether or not with respect to Jordan Hines you subjected the Klotz fixative to the high pressure liquid chromatography method, and I believe that you said no.

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When you were asked by him how you could be sure or you could be confident in your estimate of the 250 nanograms in the heart tissue, you indicated that one of the assumptions that you made was that any digoxinlike substance in the Klotz solution would have been derivatives of digoxin.

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That was your answer was it not?

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A. That was my stated assumption, that is right.

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Q. All right. Now I would like to see if I can understand that because that is rather important to me that I understand why you were able to give that answer.



EE11

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2 When you first appeared before the
3 Commission on June 22, 1983, I recall discussion
4 between Mr. Lamek and yourself whereby you told Mr.
5 Lamek that there were basically two groups of things
6 which could cross-react with your digoxin antibody.
7 Do you remember that discussion?

8 MR. HUNT: I'm sure he doesn't
9 remember. Have you got the page?

10 MR. TOBIAS: Q. All right. If
11 I can be of some assistance, Mr. Cimbura, I am re-
12 ferring to Volume No. 2, page 112. I won't read it
13 to you word for word, but tell me if this jives with
14 your recollection of your evidence.

15 I believe that one of the things
16 that you told Mr. Lamek is that one of the groups
17 that would tend to react with your digoxin antibody
18 was the metabolites of digoxin; is that correct?

19 A. Yes, that is true, yes.

20 Q. Okay. And I think you also
21 told him that the other group of things that you
22 would expect to react with the digoxin or cross-react
23 with the digoxin antibody were chemically -- chemicals
24 which were molecularly similar to digoxin.

25 Is that also correct?

A. I don't recall exactly --



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MR. LAMEK: At the foot of page
112.

THE WITNESS: I may have been re-
ferring to digoxin derivatives such as --

MR. TOBAIS: Q. Well, in particular
I am referring to Lanatoside C which was one example
you gave of a drug which was molecularly similar.

A. If you are referring to that,
yes, that is very similar to digoxin, yes.

Q. Okay. Fine.

Now first of all with respect to
the metabolites, is it true that basically what they
are is a derivative of digoxin in this sense: in the
sense that after digoxin is administered and after
the body works on the digoxin it breaks it down into
its derivative components. Is that a fair statement?

A. With respect to metabolites,
those are products of digoxin produced by the body,
that is right.

Q. All right. What you told us
at page 113 the last time you were here is, and
Mr. Commissioner, to assist you, this is three lines
from the bottom of page 113:

"Of course, as I mentioned pre-
viously, the metabolites or the
breakdown products of digoxin are



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produced in the body after digoxin
is administered."

Do you recall giving that evidence?

I put to you again have I under-
stood you to mean by that that basically the meta-
bolites of digoxin are derivative products which the
body in acting on the digoxin after administration
produces?

A. I suppose you could call
it that. It is a technical definition of what
derivative means...

Q. All right. It is a fairly
ineloquent summary, but I have got the principle right?

A. I think in a sense I think
what you are saying is correct.

Q. All right. So do you agree
with me in order to find the metabolites one would
first have to inject or introduce into the body the
digoxin? If there were no digoxin there would be
no metabolites of digoxin in the sample?

Do you agree with that?

A. That is what I would under-
stand, that is right.

Q. Now with respect to the
other factor, and that is the chemicals or the drugs



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that are molecularly similar to digoxin, I take it that when we are talking about Klotz solution you know what the chemical makeup of Klotz solution is?

A. I know the composition, that is right.

Q. So that you would know whether any of these similar chemicals were in Klotz solution and obviously you are satisfied that they are not?

A. Well, yes, I see -- I'm sorry, I see what you are getting at.

Part of the documents that I have introduced is that Klotz solution does not react with the RIA, that is right.

Q. Exactly. So there would be no reason because of that to subject it to the HPLC in order to separate digoxin from digoxinlike substances.

Is that correct or have I missed something?



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A. Well I know that the Klotz solution does not react with the RIA.

Q. And if you did find anything that cross-reacted those would be the metabolites, is that correct?

A. And the substances that are in the Klotz solution, the derivatives of the substances which I believe are derivatives of digoxin.

Q. Exactly.

A. I have not been able to identify them, I don't know what they are.

Q. My point is this, Mr. Cimbura. If you tested the Klotz solution and you found a positive reading you would know it was either digoxin or the derivatives of digoxin that was reacting with the antibody?

A. Well from that point of view if that was the only specimen I had ---

Q. Yes.

A. ... I would want to do HPLC. You know, in these cases HPLC was done on some regions of the heart.

Q. Yes.

A. To let me know there was digoxin present.



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Q. No, no, I am referring now only to the assay that you run on the Klotz solution itself.

A. That is right. So I have not run HPLC so that it could be.

Q. I am sorry, it could be?

A. If I haven't run HPLC I wouldn't be able to express any digoxin in that Klotz medium.

Q. Digoxin as opposed to the digoxin metabolites; what I am saying is if you ran the assay on the Klotz solution itself and it produced a positive reading, you would know that what you were reading was either digoxin or digoxin metabolites, is that fair?

A. Well, I believe I would have to know also that in some part of the specimen there is digoxin as identified by HPLC analysis, which happened in the specimen of Cook.

Q. Right.

A. I'm sorry, I mean the specimen of Baby Hines. As you noticed, as you said yourself the left ventricle was analysed by both HPLC and RIA?

Q. Yes.



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A. And the digoxin was identified.

Q. Yes.

A. So that in combination with that finding I could make the conclusion that you wanted to have.

MR. TOBIAS: All right. Thank you, those are all my questions, Mr. Commissioner.

THE COMMISSIONER: Thank you, we will take 15 minutes.

---Short recess.

---On resuming.

THE COMMISSIONER: Mr. Shanahan, are you next?

MR. SHANAHAN: I am not, but I don't mind.

THE COMMISSIONER: Are you not next?

MR. SHANAHAN: I don't think I am really, but I am ready.

CROSS-EXAMINATION BY MR. SHANAHAN:

Q. Doctor, my name is Shanahan and I act for the families of Lombardo and Dawson children.

Mr. Cimbura, if you could turn to the reports, they are all stapled together, but I think the ones for, the report for Amber Dawson are found at page 11 of your first report of January 11,



1
2 1982.

3 Now, as I look at it here I think
4 you have made it clear to Mr. Lamek that the testing
5 that was done there was both the RIA and then the
6 RIA after the HPLC, is that right?

7 A. Which particular region of
8 the heart are you referring to, sir?

9 Q. I thought you indicated that
10 both the heart and the lung and the fluid, all of
11 those testings had been done in duplicate in that
12 manner and that you reached the conclusions that you
13 have stated there. That is where I want to start
14 from, is that right?

15 A. The conclusion, which
16 conclusion, I am not quite clear.

17 Q. Well on the heart you have
18 got "Left ventricle, septum, lung".

19 And you have got: "No digoxin could
20 be detected".

21 A. That's right. That indicates
22 that HPLC was done on those three, that's right.

23 Q. As I take it too, we know, we
24 have heard sir, that the coroner was notified with
25 respect to Amber Dawson, that the autopsy was done
by Dr. Cutz at the Hospital for Sick Children. I



1
2 take it that you did your sampling on all tissues
3 that were provided for you, and it seems to me here
4 quite obvious that you were never supplied with any
5 autopsy blood with respect to Amber Dawson?

6 A. That is right, that is correct
7 as far as I am aware, that's right.

8 Q. Do you know, sir, and it is
9 a bit much to ask; do you know, was that ever
10 discussed or requested, or did you ever speak to
11 Sergeant Warr about that, as to whether there might
12 be blood given that she was a coroner's case and
13 that the autopsy had been done at Sick Children's
14 Hospital; did that issue of her blood and the
15 availability of it ever come up?

16 A. I feel confident it has, that
17 is the information I was relating to the police that
18 blood is a very useful specimen for analysis in all
19 these children.

20 Q. It would seem then that they
21 probably looked for it and it just simply wasn't
22 there?

23 A. Well, you can ask them.

24 Q. Now, bearing in mind here as
25 well that you would have got here what seems to me
to be tissue from the heart and lung of Amber Dawson



6 1
2 that would have been fixed in a Klotz solution?

3 A. That is correct, sir.

4 Q. And bearing in mind her date
5 of death, sir, which would be around July of 1980,
6 it would have been fixed in Klotz solution by the
7 time you examined it for approximately 18 months?

8 A. Well I have ---

9 Q. January 1982.

10 A. You might be right but I would
11 have to do estimations, sir.

12 Q. Roughly around there. All
13 right. The issue of embalming fluid doesn't come
14 up here, sir, but I think you have indicated that age
15 of the child had an impact on the digoxin results that
16 you would get, is that correct?

17 A. Are you referring to, which
18 results, to heart tissue results?

19 Q. Heart tissue results.

20 A. As I recall it I believe I
21 mentioned that age is one of the factors that should
22 be considered with respect to concentrations, for
23 example, in the heart tissue, fresh autopsy heart
24 tissue of children, that's right.

25 Q. And I think the anomaly that
you referred to was that if the same dose were given



1
2 we will say to a one month old child and to a one
3 year old child, and fresh autopsy, heart autopsy
4 samples were taken that you have observed that there
5 seems to be a higher reading in the younger child
6 of digoxin in heart tissue, am I right there?

7
8 A. There may be, yes, there is
9 a general trend to that effect, that is right.

10 Q. All right.

11 A. Whether it be specifically
12 the child, because I don't know until I would analyse
13 it but there may be.

14 Q. I am sorry.

15 A. There may be.

16 Q. There may be, all right.

17 There appears to be a trend?

18 A. That is right.

19 Q. And finally, sir, I think
20 without referring you specifically in Exhibit 213,
21 it appeared to me that digoxin in the Klotz solution
22 itself, if you recollect the chart that you had there
23 it was left in Klotz solution I think for close to
24 seven months; and the digoxin in general in samples
25 that were in Klotz solution that over the passage
of time the amount of digoxin and the reading of
digoxin lowered?



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A. That's right, there was a decrease with time, that is right.

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4

Q. And then you made a note here, which is like a conclusion:

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"From the data derived ..."

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I am on the same page, sir, page 11:

7

"From the data derived from the T35,..."

8

and those are the tests that you did:

9

"...it is likely that the concentrations of digoxin in the heart and/or lung tissue before they were fixed in Klotz solution were higher than the concentrations found."

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A. That is correct, sir.

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Q. And that of course would

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just fit in with the last test, if you like, or

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sampling that you referred me to, and that was that

17

you were working backwards 18 months fixed in Klotz

18

solution and you assumed some lessening if you like of the digoxin reading?

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A. That is correct, sir.

20

Q. Leaving aside Dawson then,

21

sir ---

22

THE COMMISSIONER: Before we leave

23

aside Dawson I would just like to make sure. What

24

25



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9 2 is the page in 213, the Klotz solution?

3 MR. LAMEK: 11.

4 MR. SHANAHAN: The page for Klotz alone,
5 sir, is 11.

6 THE COMMISSIONER: That is the
7 diagram, isn't it?

8 MR. SHANAHAN: "Stability of digoxin
9 in Klotz solution", Mr. Commissioner.

10 THE COMMISSIONER: And you have, as
11 far as period of storage 160 days.

12 MR. SHANAHAN: Well I think that page
13 13 as I read it, and I hope I have read these right
14 then compares: Klotz, fixed heart and lung over a
15 period of 6 to 9 months and I think that showed,
16 and Mr. Cimbura will correct me if I am wrong, that
17 seemed to show the fall-off in digoxin readings
18 when it was fixed in Klotz.

19 THE COMMISSIONER: This may be
20 fundamental, but you would make a test in which you
21 get a reading of let's say 50 nanograms and then you
22 do an HPLC test and it goes down to zero, that means
23 all of the digoxinlike substances, all of the
24 digoxin that you found is really digoxinlike,
25 probably its product is digoxin, am I right so far?

THE WITNESS: I assume that all the



1
2 digoxin has degraded down, that's right. So that
3 digoxin itself is below our detection levels.

4 THE COMMISSIONER: Your assumption in
5 doing this is that it was all once digoxin, is that
6 it, am I correct in that?

7 THE WITNESS: That is correct, sir.

8 MR. SHANAHAN: Q. I am afraid I
9 didn't hear you, Mr. Commissioner.

10 THE COMMISSIONER: The assumption is
11 that it was all once digoxin and by refining it
12 further you discover that it is now one of the off-
shoots of digoxin itself, is that right?

13 THE WITNESS: In some I am discovering
14 it is just the offshoots of digoxin, that is right,
15 but of course ---

16 THE COMMISSIONER: But you draw the
17 conclusion I take it that it was once digoxin?

18 THE WITNESS: The assumption that
19 I draw is that initially it was digoxin, that is
20 right.

21 THE COMMISSIONER: Is there any way
22 of comparing the, what is the chemical term for it,
23 the offshoots?

24 THE WITNESS: The degradation products?

25 THE COMMISSIONER: Yes, what is it



1
2 called, I'm sorry, it is the end of the week, you have
3 used it at least 28 times along here, these digoxin-
4 like substances, the products of it, it doesn't matter
5 what the term is. Have you any way of determining
6 the amount of the digoxin that was there based upon
7 the digoxinlike substances that you found, it is not
8 the same amount I take it?

9 THE WITNESS: Oh, I would expect it
10 to be higher in the beginning, that's right and the
11 only estimation.

12 THE COMMISSIONER: If you get a reading
13 in an RIA finding a figure of 50, and HPLC figure is zero,
14 that is you have no digoxin there, but you know that
15 there are 50 nanograms of digoxinlike substance, have
16 you any way of calculating what the digoxin was at
17 any time?

18 THE WITNESS: Well, yes. I have
19 given that estimate with respect to tissues that were
20 placed just by themselves.

21 THE COMMISSIONER: All you say is
22 that it was greater than that?

23 THE WITNESS: In some tissues I have
24 given an estimate of a minimum concentration, yes.

25 THE COMMISSIONER: Could you give me
an example of that?



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THE WITNESS: Yes, sir.

THE COMMISSIONER: For instance you did
in T35 the very one we are doing, Dawson?

THE WITNESS: I couldn't do it here
because there were two tissues placed into the
container, and for that reason I couldn't get that
estimate because I felt it would not be reasonable.

For example if you go to my page
7, which are tissues, which is the heart tissue alone
from a child Kristin Inwood; and on page 8 I draw,
I estimated a minimum concentration of digoxin in
the tissue before it was fixed.

THE COMMISSIONER: And that is the
part in the heart, I don't want you to go into it
too deeply but can you give me some idea how you
calculated; for instance you have 323 of the mixture
of digoxin and digoxinlike substances and this is
the left ventricle; and you have got 230 nanograms
of digoxin, poor digoxin at that point and you estimate
then that the amount of digoxin in the heart was
not less than 549, how would you do that?

A. Yes, sir, if I may explain
that.

THE COMMISSIONER: Yes.

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THE COMMISSIONER: Yes.

THE WITNESS: I have multiplied, I have only used the concentrations obtained by the RIA for that purpose under the assumption that the digoxinlike substances were derived from digoxin.

THE COMMISSIONER: Yes.

THE WITNESS: So that I have multiplied the volume of the Klotz solution that I knew for example in the Baby Inwood. If you go to page 8 there is a volume 450 ml. This was the volume of the Klotz solution surrounding the tissue. I have multiplied that by the concentration in the Klotz tissue, in other words, by the 31 to give me a total amount of digoxin and/or digoxinlike substances in the Klotz medium surrounding the heart.

THE COMMISSIONER: All right.

THE WITNESS: I have divided this total figure into the weight of the heart of Kristin Inwood, the weight at the autopsy which would give me the nanograms per gram in the fresh heart tissue of Inwood. To that I have added the minimum amount that I have found in the regions of the heart, whatever was the lowest, and I came within an estimate as presented.

THE COMMISSIONER: Yes, all right.



GG.2

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Thank you. You go on then, Mr. Shanahan.

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MR. SHANAHAN: Can I take over, all
right, thank you.

4

(2)

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Q Lombardo, Doctor, we know is a
child that died in September of 1980 and it was 10
days old, had been in The Sick Children's Hospital
since the day of its birth and had been on the ward
prior to its death for a day.

8

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Now, as I looked at Lombardo's readings
in general, just looked at them quickly and compared
them to other exhumed tissue that you looked at and
it seemed to me that in general Lombardo's readings
were the highest readings that you got in exhumed
tissue?

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A. That is correct, sir.

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Q All right.

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A. At least in tissues that I am
talking about are tissues such as heart.

18

Q Yes.

19

A. Lung, liver. Perhaps I should
go to my report. Could you direct me to it.

20

21

Q All right, I will direct you to
it. We have it as Exhibit 95C, it is the report of
March 25th, '82 and then it is page 2 of that report,
sir.

22

23

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GG.3

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2 In general, sir, as I saw this as we
3 looked at the development of testing for digoxin The
4 Sick Children's Hospital were doing regular RIA
5 assays on antemortem blood samples. It seemed to me
6 then that you went into the area and they to some
7 extent of postmortem blood and tissue with these
8 reports that you have given us in 213 and the other
evidence you gave us at your earlier testimony.

9 Then the third area that seemed to be
10 the real problem area, or more of a problem area was
11 that general area then that started to develop during
12 the Nelles Inquiry of exhumed tissue and how you would
approach exhumed tissue.

13 A. Approach - I think I know what
14 you mean but approach from what point of view?

15 Q. Well, from testing. Just to
16 even find digoxin let alone interpret it?

17 A. That's right, it posed some
18 additional complications.

19 Q. All right. And then as I looked
20 at that group of babies that had tissues exhumed,
21 Lombardo's really seemed to be unique from the
22 perspective that, well, obviously it was never fixed
23 in Klotz and it was also one of the children that I
24 saw in the exhumed that was not embalmed. Is that
25 correct?



GG.4

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A. As far as I can recall, yes.

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Q. That seemed to be your evidence

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too, I think it was yesterday it was given your

5

evidence from the preliminary, your evidence was that

6

the tissue of Lombardo had not been embalmed at all.

7

All right?

A. Okay.

8

Q. Now, as I see it here the best

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of all samples would be of course the fresh from

10

autopsy but it struck me, sir, and I appreciate there

11

are problems with deterioration over 18 months to 2

12

years, but at least the Lombardo sample is not

13

complicated in any way by Klotz solution, whatever

14

complication that might be, or by embalming. It is

15

really fresh tissue entombed for 18 months, 2 years,
what-have-you.

16

A. With the result that it is not

17

fresh any more after 18 months, yes.

18

Q. So, you have in Lombardo then

19

not the problem if there is a problem with Klotz

20

solution or the problem with embalming fluid, you

21

have purely and simply that the massive problem, I

22

agree, but the problem of degradation of this tissue
in general?

23

A. Well, that is one of the problems.

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GG.5

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There are other problems.

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Q All right. And again here, sir, in terms of your overall experiments when you were dealing with blood and heart tissue here in Exhibit 213, it seemed to me that the general passage of time when you had digoxin in Klotz solution, for instance, over the passage of six to seven months there was a dramatic decrease in the amount of digoxin that was then in your sample?

A There was a decrease, in some cases dramatic, yes.

Q In the embalming fluid as well in Exhibit 213 when you took digoxin embalming fluid and left it there for a period of time again there was a fall off, a large fall off in the amount of digoxin that was assayable there?

A Under the conditions studied, yes.

Q All right. And then finally tissue that was fresh and then put in Klotz and studied at a later point in time, again, you found a fall-off in the digoxin readings there as well?

A That's correct.

Q All right. Now, Lombardo of course is different and it is a jump, no question, but what you found, the readings that you found in



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Lombardo are clearly given what your recovery studies were and that you didn't compensate for the recovery factor, they are on the minimal, the conservative side, those readings that you have given us here. Am I right there?

A. That's what I would expect, that's right.

Q. All right. And I think you said as well as not compensating for the recovery factor that the recovery factor was higher in the high blood readings and, again, we are extrapolating from blood to exhumed tissue, but when you were talking about recovery factor and compensating, your recovery factor was even higher when you got into the higher readings?

A. I think I know what you want to say but I'm not sure if you're saying it correctly.

Q. All right, you say it right because I probably never will.

A. I think, if I am correct, are you saying that with the very high concentrations you may get lower recoveries?

Q. That's right.

A. You may, that's right, yes.

Q. All right. And you didn't compensate, so, what I'm saying is that the higher



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the reading got, and I'm looking here at T53 in Lombardo, there is 667 nanograms per gram of digoxin, that the higher the reading got it would even be more to the low side as you get into the higher regions?

A. Well, I'm not really sure.

Q. You're not sure?

A. The extraction, the fact that the extraction was carried out, that would tend to make them minimal.

Q. All right.

A. The other factors that are involved are factors such as, you know, dilution, small dilution errors when you have to dilute many times and they are unpredictable, they can go one way or the other.

Q. I appreciate the dilution, yes, that can go one way or the other. But I did think that when you didn't compensate for recovery that that made your estimates minimal and conservative and then when I tied that in with another comment that the higher the dig. reading - in blood mind you - the lower the recovery rate and accordingly therefore that even more compensation would be needed, compensation upwards in the dig. reading?

A. Well, I'm not quite sure.



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Q. Could be?

A. I would have to look at that document again.

Q. All right. In any event then as you test Lombardo you come to the conclusion here, sir, and that is on page 3 of the document I think you have found:

"In view of the length of time the body had been buried it is difficult to assess the significance of the digoxin concentration found in the various tissues. Nevertheless, the possibility of digoxin poisoning must be considered in this case."

There was no question, sir, in that note that it may be difficult to assess the significance, there was no difficulty and there didn't appear to be any doubt in that note that the presence, the mere presence of digoxin in your mind was unequivocal, unquestionable?

A. That the presence of digoxin ...

Q. That's right.

A. Oh, yes, I expressed it as digoxin, certainly.

Q. All right. Sir, I took it that



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you were firm in that conviction because you had done it not only by RIA, you had then done it by RIA after HPLC and you also, with the Lombardo in a combination mixture I think of heart and lung tissue, you also used the mass spectrometry technique?

A. That is correct, sir.

Q. All right. And all three confirmed for you the presence of digoxin and the RIA and the RIA/HPLC actually gave you readings?

A. Well, the HPLC, you could almost say confirmed by digoxin.

Q. All right.

A. The GC mass spec. was an additional bonus, you could call it.

Q. There was no question about the presence of it. The significance was a problem. You conclude:

"Nevertheless, the possibility of digoxin poisoning must be considered in this case."

Moving ahead, sir, into some of the other children, and this would be Exhibit 95E on exhumed tissue, and I am not going to - you seem to get into a standard phraseology, sir, that differs really from what you concluded on Lombardo's. I will



GG.10

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2 read one in full and that, sir, is the report of
3 September 29th, Exhibit 95E, page 2, on the child
4 Bilodeau. On page 3, the child here who had been
5 embalmed, you say:

6 "3. The embalming process, the long
7 burial period and the resultant
8 decomposition may have influenced the
9 digoxin concentrations to an extent
10 which cannot be assessed with a
11 reasonable degree of scientific
12 certainty. For this reason, comparison
13 of digoxin values in the exhumed
14 autopsy material with those of 'fresh'
15 autopsy tissues may not be valid."

16 And then you conclude:

17 "In view of this and other factors,
18 the results obtained in this case are
19 considered inconclusive with respect
20 to digoxin toxicity."

21 And, sir, as you go on to others,
22 Gionas, Barbara Gionas follows, you conclude in
23 paragraph 3 the same wording again: "... inconclusive
24 with respect to digoxin toxicity." for the same factor.

25 Inwood follows
and it has the same, and many others do.



GG.11

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Was Lombardo, just because it was done
earlier, different wording, or does it indicate, as
I read it, that with Lombardo, because of the very
high readings you are prepared to go even further
than you did in those other children that I mentioned,
and there were more I could have taken you through
there, and be able to conclude that digoxin
poisoning had to be considered.





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A. Well, first of all, to answer your question, the different way of expressing the notes is mainly because of difference in time between the two reports.

Q. There is no particular magic to the wording?

A. Pardon me?

Q. There is no particular magic to the wording, as you got later you just seemed to fall into that pattern.

A. At that time we had a whole group of children that had been exhumed. Baby Lombardo was more or less isolated at the earlier time.

Q. That's what I thought, yes.

A. And it was later on in time and by that time I reached a definite conclusion that the results in the exhumed tissue are by themselves inconclusive; inconclusive meaning of course, as I would appreciate and I'm sure you know that, it may or may not be, I cannot rule out the possibility.

Q. I understand. It just struck me as more doubt came into the air around April, September, December of '82 you weren't prepared to be as definitive.



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A. And also one difference of course between the child Lombardo and some of the others was that, as you said, child Lombardo was not prescribed digoxin.

Q. Right. Well then, this is the final series or set of questions. Lombardo was prescribed digoxin and wasn't embalmed, as we see here. It seems to me, sir, that we are never going to be able to set up a protocol, if you like, for ever finding out the meaning of readings in exhumed tissue from a child like Lombardo. It may be obvious because you would have to get a child and give it digoxin by either therapeutic or overdose, not embalm it.

A. Well, you could have a child who died accidentally with a digoxin overdose, that's right.

Q. All right. But all the other circumstances really are almost in a laboratory setting impossible to reproduce.

A. I agree, yes.

Q. The fact of no embalming, wait for a couple of years.

A. I agree.

Q. Is that right?



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A. Yes, and also the question of course of exhuming the child for the purposes of the research.

Q. That's right.

A. I don't think it is possible.

Q. No.

THE COMMISSIONER: Would the exhuming do it?

THE WITNESS: I beg your pardon?

THE COMMISSIONER: What would the exhuming do itself?

THE WITNESS: To study what may happen.

THE COMMISSIONER: No, no, I know you would have to do that.

MR. SHANAHAN: I think he meant storage conditions. You are not at room temperature, you are not in a fridge, you are sort of in that whole, whatever entombing does to tissue.

THE COMMISSIONER: All right. But tell me this. If a child never did have digoxin, could there be digoxin found in its tissues after any amount of time?

THE WITNESS: I don't know how, sir.

THE COMMISSIONER: Where would it



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come from?

THE WITNESS: I don't know how, sir.
I don't believe so, no.

THE COMMISSIONER: Whatever it was -
I mean, it might have been a very small amount of
digoxin that you had, but could it get it any way
in any natural process that you know of? You may
not be able to answer this question.

THE WITNESS: As far as I know, no
endogenous digoxin itself is produced in the body.

THE COMMISSIONER: No, but the
process of decay itself, would it not, as far as you
know?

THE WITNESS: As far as I know there
would be nothing published on that, there would be
no reports on that.

THE COMMISSIONER: I see, all right.

MR. SHANAHAN: All right,
Mr. Commissioner?

THE COMMISSIONER: Yes.

MR. SHANAHAN: Q. And then one
final thing then, sir. In terms of us never being
able to really reproduce the Lombardo situation again,
as you carried what the Sick Children's had done in
normal - in life blood testing and then you carried



3GG5

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3 it into and refined the techniques with respect to
4 tissue and then after death post mortem and then
5 to go from there into the area of Lombardo which
6 was tissue not preserved, not embalmed, just simply
7 if you like set aside for a year or two and the
8 readings that you got, in all other areas, by the
9 Lombardo, the exhumed tissue area, with the passage
10 of time, be it embalming fluid, Klotz fluid or what,
11 fresh and then fresh gone into fixed in Klotz, in all
12 other samples digoxin did what I as a layman would
anticipate and, that is, that with the passage of
time it lessened in tissue and in blood.



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A. In specimens that were
preserved in chemical preservatives.

Q. All right. So we would
be asking you or someone else to make the leap then
and to say and to infer it would only be a leap or
a guess as to whether in tissues such as Lombardo's
that hadn't been embalmed and had not been fixed as
to whether in fact digoxin would fall from the point
of having the dose to a point in time two years later
when it would be looked at by your RIA and HPLC and
mass spectrometry.

A. That is right, it would be
a guess I feel.

But there is another factor, of
course, to be of concern and that is with a burial,
long burial, there may be a drying of tissue to some
degree which would tend to go the other way.

In other words if there was a
drying, it would tend to artificially increase the
levels as compared to what they were at the beginning.

Q. As fluid dried out of the
body and the body tissues, the remaining concentration
of digoxin may be inflated?

A. That is right. When
expressed per nanogram per weight, that is right.



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Q. Just on that other issue,
in all other areas digoxin over time lessens in the
readings in tissue and in blood?

A. In preserved tissues.

Q. And certainly, sir, therapeutic doses in life did not produce for you in
fresh or fixed autopsy samples, did not produce the
readings that you found in Lombardo?

A. Would you repeat that again?

Q. Therapeutic doses in some
of the experiments that you recorded in Exhibit 213,
therapeutic doses in life of a child did not produce
readings in tissue that you found in the Lombardo
child after exhumation?

A. Well, one couldn't
generalize.

There was a very general statement
that would have to be broken down, you know, into
more detail. I know what you are attempting to say
but before I could comment we would have to break
down piece by piece.

Q. And of course again as you
said before you would have to make the leap between
tissue that was fresh and tissue that was exhumed?

A. That is right.



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MR. SHANAHAN: Thank you, sir.

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THE COMMISSIONER: Mr. Shinehoft,

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please.

5

CROSS-EXAMINATION BY MR. SHINEHOFT:

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Q. Mr. Cimbura, my name is

7

Jack Shinehoft and I represent the parents of Kevin
Pacsai.

8

I understand, doctor, that you have

9

indicated to us that your profession is that of a

10

forensic toxicologist; is that correct?

11

A. That is my specialty,

12

that is right, sir.

13

Q. And as part of that job do

you analyze blood and tissue samples?

14

A. Blood and tissue samples,

15

that is correct.

16

Q. Do you do that for the

17

purposes of determining the cause of death?

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A. For the purposes of assisting

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to determine the cause of death, that is right.

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Q. And you indicated that you

did these blood and tissue samples as far as the

21

child Kevin Pacsai is concerned?

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A. You are referring to my

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report, sir?

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Q. Yes, sir. You did those analyses as indicated in your report?

A. They were done in my laboratory, that is right, sir.

Q. Under your supervision?

A. That is right.

Q. And did you come to a conclusion as to the cause of death as far as Baby Kevin Pacsai is concerned?

A. Well, cause of death is not my function.

Q. Well, correct me if I am wrong but didn't you just tell me, doctor, that --

THE COMMISSIONER: He specifically said to assist in determining the cause of death.

MR. SHINEHOFT: Okay.

Q. And did you come to a conclusion as to the cause of death as far as this baby is concerned?

THE COMMISSIONER: That is what he is trying to do here. He is trying to help us.

MR. SHINEHOFT: Yes.

Q. But you have done some testing and you have got some results and presumably you interpret those results, do you not?



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A. With some respect, that is

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right, sir.

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Q. And how did you interpret

the results that you found?

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A. Do you wish me to go into

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my report?

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Q. Yes. Basically did you

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come to a conclusion as a result of the test data

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or the results that you ascertained?

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A. Yes, I recall the findings

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but I would just like to have a look at my report to
make sure.

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Q. Oh, sure.

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THE COMMISSIONER: On page 5.

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THE WITNESS: Yes, that is right.

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There is a sample -- there is a

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specimen of serum which I understand was obtained

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post mortem from the Child Pacsai and that specimen

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was found to contain 26 nanograms per millilitre of

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digoxin.

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MR. SHINEHOFT: Q. Yes.

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A. This value is within the

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fatal range of values for blood or serum. And for

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that reason in my opinion it could account for death.

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It could account for death.

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Q. Okay. Now you came to that conclusion I believe sometime in 1981; is that correct?

A. That is correct, yes.

Q. And has that opinion changed from 1981 to today as far as that is concerned?

A. No, sir.

Q. You feel qualified to comment on the value that you obtained, this reading of 26, on how that reading came about in the context that it could have come about by a mistake or accidental overdose or is it possible that it came about by deliberate overdose?

Now, first do you feel you are qualified to give an answer to that question?

A. I cannot, no. From my findings it doesn't tell me whether it was given or taken accidentally or deliberately.

Q. All right.

A. It doesn't permit me to conclude.

Q. But you do and you did come to the conclusion that the amount of 26 nanograms is a toxic amount which could account for this child's death?



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A. It could account for this
child's death, that is right.

Q. And --

A. In combination with another
finding which we haven't gone into but I have taken
both into consideration, that is right.

Q. You took the tissue sample
into consideration as well, doctor?

A. There was one tissue sample
in the -- let me find it.

Q. Tissue sample, I believe on
page 4?

A. Not really that one. There
is another tissue sample --

MS. CRONK: Page 5, September 29.

A. On page 5 of my report of
September 29.

MR. SHINEHOFT: Q. Yes. That is
your tissue sample?

A. Yes. This is a little
bit different tissue sample since it was reported to
me to be -- to have been kept frozen at the Hospital
until I received it, which would make it equivalent
to fresh autopsy sample.

Q. Okay.



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A. And that tissue which was a lung tissue, the tissue was found to contain 122 nanograms per gram of digoxin.

Q. Okay.

A. This value is also elevated as compared to controls. By itself this value would not be conclusive in my view to digoxin toxicity but in combination with the previous finding it permitted me to give an opinion that I believe the findings could account for cause of death as a possibility.

Q. All right. Did you in your analysis of both blood and tissue samples come to any other possible conclusions or any other possible determination of the cause of death or possible cause of death of Kevin Pacsai other than what you have stated to us?

A. As I recall it these were the more essential findings.

Q. I am not talking about findings. I'm talking about -- you said you did certain tests and you got certain values and you came to the conclusion based on those values that a possible cause of death may have been digoxin toxicity.

Is that correct, Mr. Cimbura?



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A. Yes, possible cause of death.

Q. Was there any other possible cause of death that you could determine from your analysis of the tissue and blood samples that were submitted to you?

A. That is not my function. That would be somebody else's function.

Q. Well, I'm just asking you.

A. No.

MR. SHINEHOFT: Thank you very much. Those are all the questions I have.

THE COMMISSIONER: Thank you very much, Mr. Shinehoft.

MR. HUNT: I have no questions.

THE COMMISSIONER: Mr. Lamek?

MR. LAMEK: Mr. Commissioner, I have and I confess it is not really my question...



HH-3-1

RE-DIRECT EXAMINATION BY MR. LAMEK:

Q. Mr. Cimbura, could you turn with me, please, to page 11 of Exhibit 213, the digoxin stability graph in Klotz solution.

A. Yes.

Q. The reference to the blip that occurs in each of those curves at about, oh, between 30 and 40 days; increases over the space of the next 10 days or so and then goes into a downward trend again.

A. Yes, sir.

Q. Were these assays done, and the times of them are indicated, solely by RIA or was an HPLC technique used prior to RIA?

A. These were done RIA only.

Q. RIA only? As I recall it yesterday I think you said - I think it was to Mr. Roland - that a blip could be accounted for by the appearance of some breakdown product of digoxin?

A. That was - I believe I stated it was a hypothesis. I have no proof of that.

Q. All right.

A. But there is a possibility that at this particular stage of time there is some re-equilibrium of the degradation products to those



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which are a little bit more reactive to the RIA at the time.

Q. In fact had there been an HPLC separation done prior to the RIA we might have known whether there were any degradation products involved in this, might we not?

A. Well, if we had HPLC then we would have known the digoxin concentrations alone.

MR..LAMEK: I have no further questions of Mr. Cimbura.

Thank you very much.

THE COMMISSIONER: All right.

MR. LAMEK: I do have one thing if I may, please.

I think I misled my friend Mr. Olah this morning with respect to the Inwood sample which yielded 491 nanograms. You will remember, Mr. Cimbura and Mr. Commissioner, I said it was my recollection that it was a sample that had come from the Haematology Department. That of course was not so.

The Haematology Department sample was the antemortem sample which upon analysis yielded a nil result of digoxin. I don't know the source of the 491 sample I am afraid.



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THE COMMISSIONER: Was that the one, though, that was heated?

MR. LAMEK: That is apparently the one that was heated. That is Mr. Cimbura's recollection of that.

THE COMMISSIONER: But it was the haematology one that was heated?

MR. LAMEK: No, the haematology one apparently was not ---

THE COMMISSIONER: I see.

MR. LAMEK: It was the one which eventually yielded 491 which is I gather a postmortem sample.

THE COMMISSIONER: All right.

Yes, Mr. Tobias?

MR. TOBIAS: Mr. Commissioner, it might be helpful for counsel if we intended to prepare over the weekend if we could get some indication from Commission counsel as to the witnesses that will be called next week and the days of the week in which it is now anticipated they will be called.

MR. LAMEK: Yes, indeed. I don't know how much preparation will be done.

On Monday I propose to call Dr. Spielberg who is a clinical pharmacologist at the



Hospital for Sick Children. He may or may not take a week.

If Dr. Speilberg is completed before the end of the week then the expectation is Dr. Phillips, the pathologist from the Hospital will be called next, and the following week I propose to call Dr. Bain although at the beginning of the week since I understand I will be elsewhere learning the mystery of things, and it may be that Dr. Izukawa ---

THE COMMISSIONER: Saying hello to my colleagues, I understand, my former colleagues.

MR. LAMEK: No, I am with your former colleagues at the end of next week, sir.

THE COMMISSIONER: Oh, I see.

MR. LAMEK: Then the week after I expect to be with the colleagues of Dr. Speilberg.

THE COMMISSIONER: Oh, yes, you are our spy.

MR. LAMEK: I am a spy, that is right.

So then next week the batting order is Dr. Speilberg, and if there is time, Dr. Phillips, and for the week after either Dr. Phillips and perhaps Dr. Izukawa at the beginning of the week followed by Dr. Bain.



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MR. HUNT: Mr. Commissioner, could I just indicate that the inventory of specimens that remain at the Centre for Forensic Sciences has been completed and I have provided a copy of it to Mr. Lamek, I don't know whether it needs to be filed as an exhibit or not.

I take it that there has still been no formal request made of you for the release of any specimens until that occurs and the matter is discussed I take it it is satisfactory for the specimens that are still at the Centre remain there.

THE COMMISSIONER: Yes, yes, that is my understanding too, but at some point perhaps Dr. Soldin and Mr. Cimbura might discuss it, discuss the problem but nothing need to be done until there is some kind of formal application and a ruling.

Until 10 o'clock Monday morning then, that is for everybody except you, Mr. Cimbura.

THE WITNESS: Thank you.

---Witness withdraws.

---Whereupon the hearing adjourned at 4:45 p.m.
until Monday, October 24th, 1983 at 10:00 a.m.

